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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE TRADEMARK TRIAL AND APPEAL BOARD

Proceeding	91207836
Party	Plaintiff Volvo Trademark Holding AB
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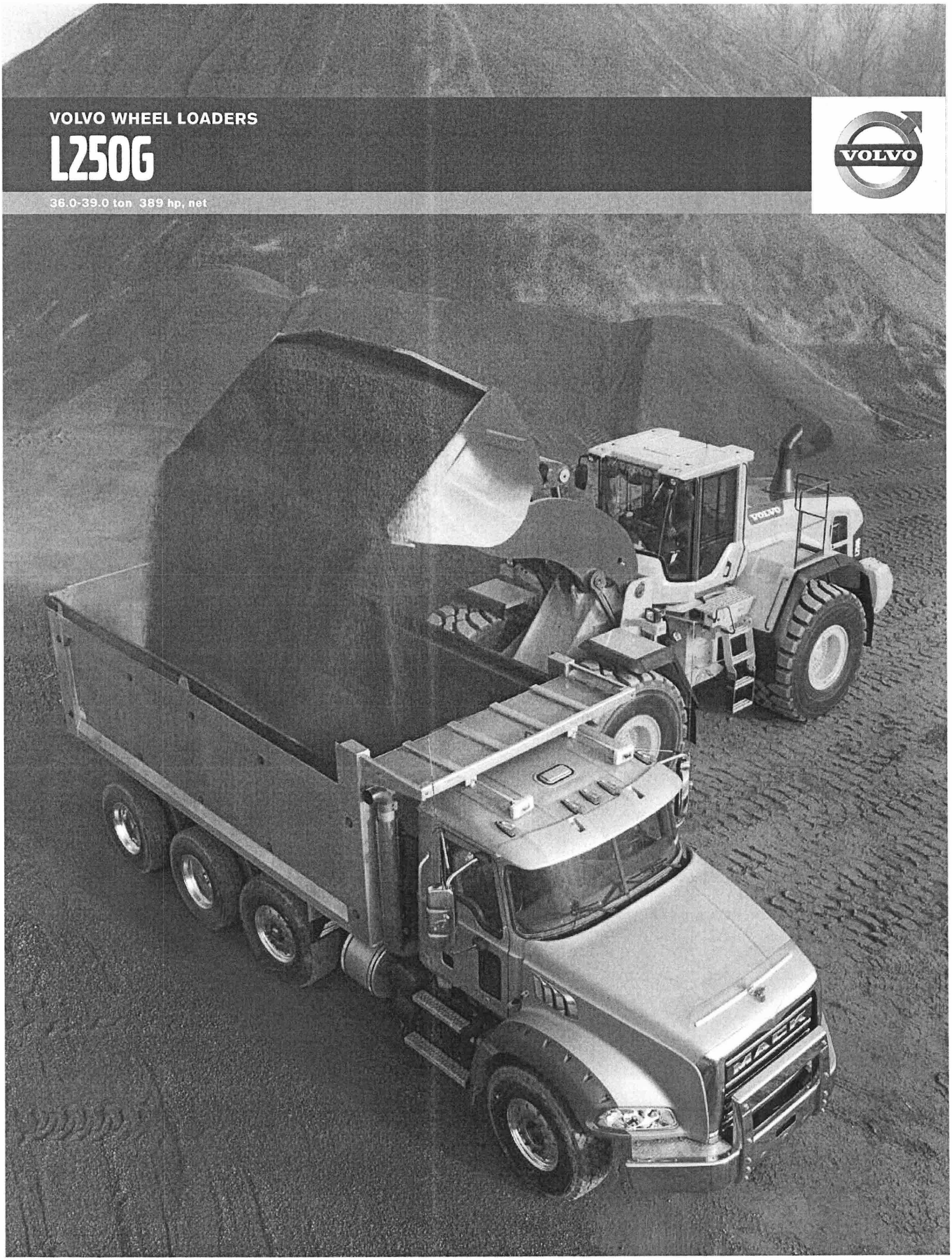
Signature	/Leigh Ann Lindquist/
Date	05/11/2016
Attachments	Deposition of M. Dempe Exhibit 12 part 1.pdf(5148628 bytes) Deposition of M. Dempe Exhibit 12 part 2.pdf(5504171 bytes) Deposition of M. Dempe Exhibit 12 part 3.pdf(5812914 bytes) Deposition of M. Dempe Exhibit 12 part 4.pdf(5034683 bytes) Deposition of M. Dempe Exhibit 12 part 5.pdf(3284005 bytes) Deposition of M. Dempe Exhibit 13 part 1.pdf(4789791 bytes) Deposition of M. Dempe Exhibit 13 part 2.pdf(5240245 bytes) Deposition of M. Dempe Exhibit 13 part 3.pdf(5567583 bytes) Deposition of M. Dempe Exhibit 13 part 4.pdf(5268519 bytes) Deposition of M. Dempe Exhibit 13 part 5.pdf(4033840 bytes) Deposition of M. Dempe Exhibit 13 part 6.pdf(3259545 bytes)

EXHIBIT 12

VOLVO WHEEL LOADERS

L250G

36.0-39.0 ton 389 hp, net



A PASSION FOR PERFORMANCE.

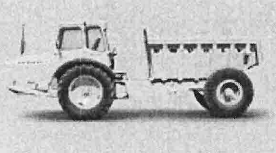
At Volvo Construction Equipment, we're not just coming along for the ride. Developing products and services that raise productivity – we are confident we can lower costs and increase profits for industry experts. Part of the Volvo Group, we are passionate about innovative solutions to help you work smarter – not harder.

Helping you to do more

Doing more with less is a trademark of Volvo Construction Equipment. High productivity has long been married to low energy consumption, ease of use and durability. When it comes to lowering life-cycle costs, Volvo is in a class of its own.

Designed to fit your needs

There is a lot riding on creating solutions that are suited to the particular needs of different industry applications. Innovation often involves high technology – but it doesn't always have to. Some of our best ideas have been simple, based on a clear and deep understanding of our customers' working lives.



You learn a lot in 175 years

Over the years, Volvo has advanced solutions that have revolutionized the use of construction equipment. No other name speaks Safety louder than Volvo. Protecting operators, those around them and minimizing our environmental impact are traditional values that continue to shape our product design philosophy.

We're on your side

We back the Volvo brand with the best people. Volvo is truly a global enterprise, one that is on standby to support customers quickly and efficiently – wherever they are.

We have a passion for performance.

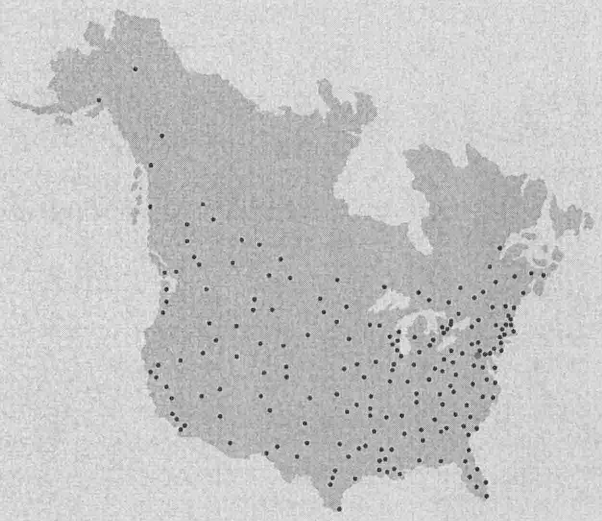
A strong, dedicated, capable dealer network.

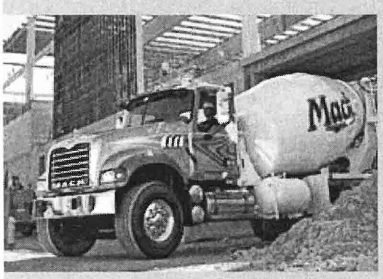
Our dealers are strategically located throughout North America to provide the equipment you need and the parts and service support you demand for a productive and profitable operation.

The strength of our dealer network is enhanced with extensive individualized product and product support training at our state-of-the-art Technical Training Center in Asheville and through hands-on training. At our nearby 80-acre Product Demonstration Center, visitors operate equipment from our entire product line under a variety of simulated working conditions. Both facilities are in year-round use by our dealers and customers – more than 2,000 visit each year. **Building the best starts right here.**

The products designed and manufactured by Volvo Construction Equipment have their beginnings at the most advanced Research & Design centers in the industry. Volvo CE machines are designed in 11 R&D centers and produced in 15 manufacturing facilities across the world.

The major R&D center and manufacturing plant in the Americas is located in Shippensburg, Pennsylvania. This facility has been in operation for over 30 years and – with its recently added 200,000 sq ft expansion – now covers 570,000 sq ft on an 80 acre campus. Dedicated work teams and highly advanced technologies and techniques using the Volvo Production System ensure continuous quality improvements, labor savings and cost control to reach the high quality that our customers have come to expect from Volvo.




Mack Trucks


Volvo Construction Equipment


Volvo Penta


Volvo Trucks


Renault Trucks

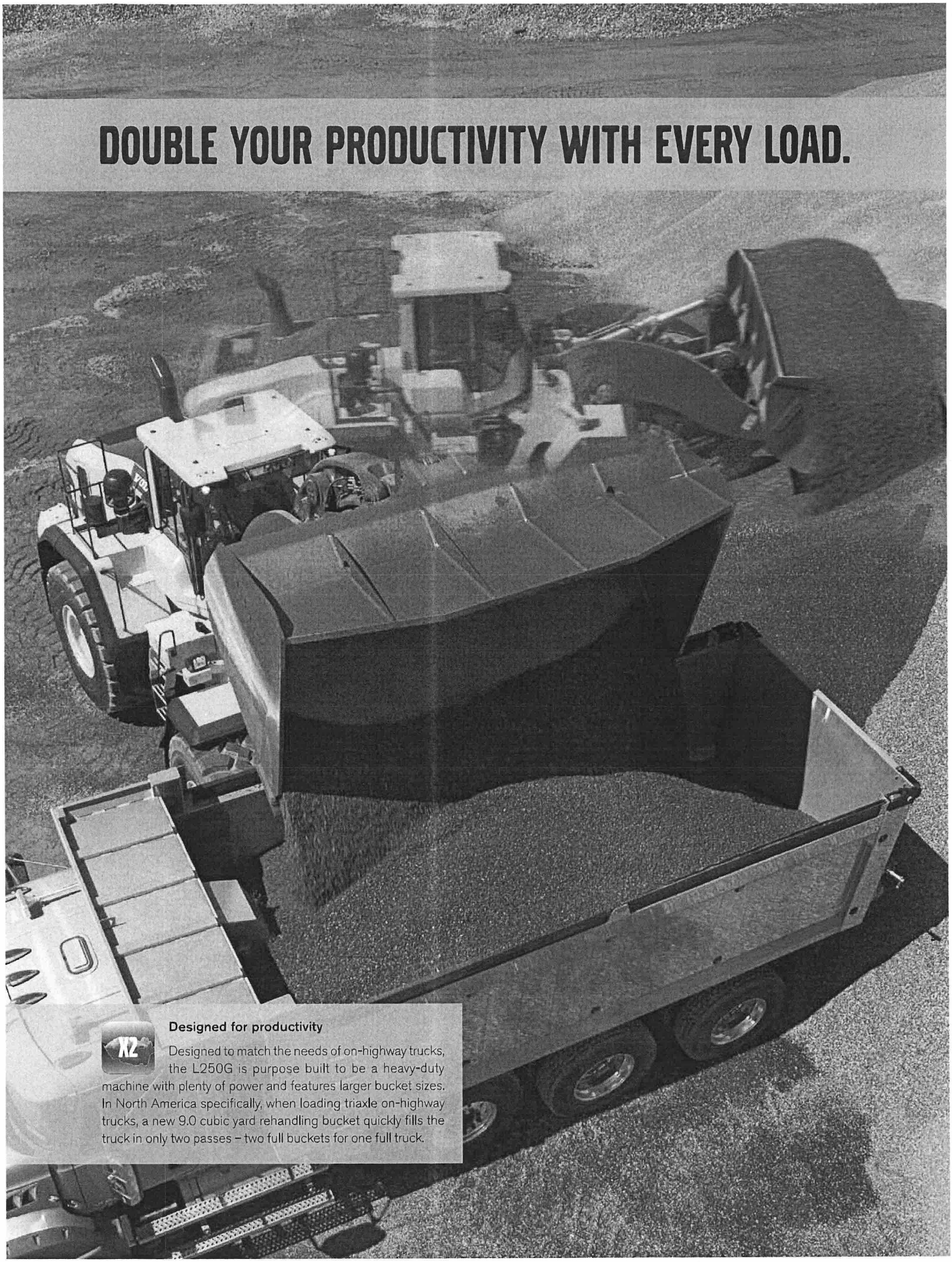
UD Trucks


Volvo Buses


Volvo Aero


Volvo Financial Services

DOUBLE YOUR PRODUCTIVITY WITH EVERY LOAD.



Designed for productivity

Designed to match the needs of on-highway trucks, the L250G is purpose built to be a heavy-duty machine with plenty of power and features larger bucket sizes. In North America specifically, when loading triaxle on-highway trucks, a new 9.0 cubic yard rehandling bucket quickly fills the truck in only two passes – two full buckets for one full truck.

MORE POWER, LESS WASTE.

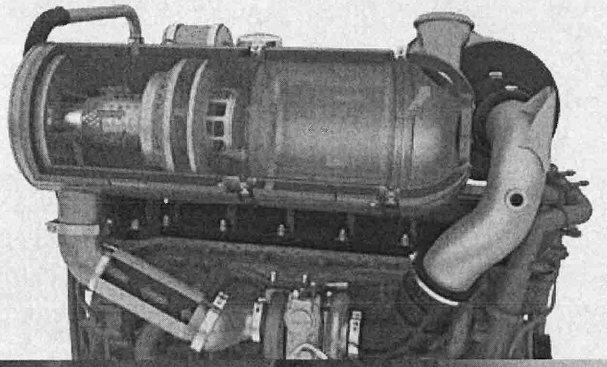
Volvo Tier 4i technology found inside the L250G has been proven by Volvo Trucks on-highway applications with ONE BILLION miles since 2007. Volvo Construction Equipment has adopted this same technology and has turned the D13 specifically for off-highway applications.

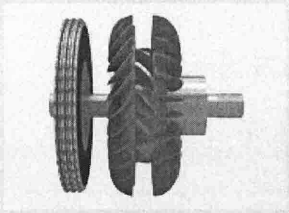
Engine performance

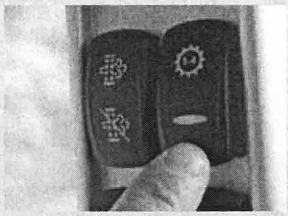
Volvo's efficient 13 litre, 6-cylinder turbocharged diesel engine gives you more power, while consuming less fuel, enabling high torque at low engine speeds. Low emission levels meet exhaust cleaning requirements for ultimate efficiency and environmental care.

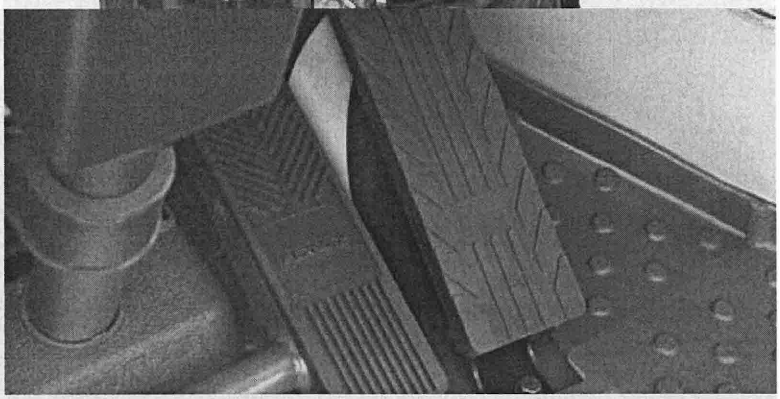
Diesel Particulate Filter with regeneration

The active-type Diesel Particulate Filter (DPF) temporarily holds the particulate matter and then incinerates it, further reducing emissions. There is no need to stop the machine in order to conduct the regeneration process; meaning no loss of performance or production.









Productive Optishift

OptiShift includes the torque converter with the unique Volvo Lock-Up and Reverse By Brake systems - applies standard service brake instead of the torque converter. The result is faster loading cycles and incline climbing performance.

Automatic Power Shift

Automatic Power Shift allows the machine to operate in the best gear according to speed, kick down and engine braking. Fully Automatic Power Shift (FAPS) automatically switches to 1st gear when additional power is needed for lower fuel consumption.

Eco pedal

The eco pedal encourages the operator to engage the throttle pedal with ease to lower fuel consumption, by applying the appropriate amount of mechanical counter pressure (push-back). This economical pedal feature promotes operator efficiency by avoiding excessive fuel use.

POWER THAT LASTS. DAY IN, DAY OUT.

Purpose-built drivetrain

Solely designed and manufactured by Volvo, the engine, transmission, axles, hydraulics and steering are developed as one unit to provide optimized performance, lower fuel consumption and maximum reliability for long machine life.

New design

The new engine hood can be electronically opened backwards for easy access and fast maintenance/cleaning. Large ventilation sections keep the engine cool for sustained performance and a wide opening angle allows for a better overview of the full engine compartment.

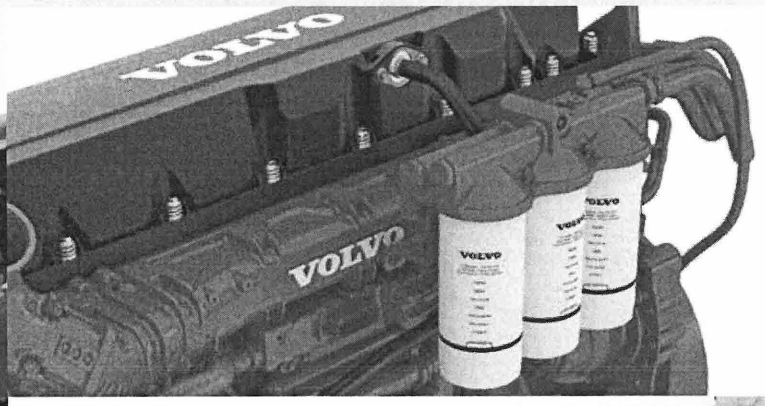
Strength and durability are at the heart of the Volvo 250G. A new engine hood design and computerized monitoring system are just some of the maintenance-saving features to help you work for longer and sustain optimum power and productivity day in and day out. Volvo won't let you down.

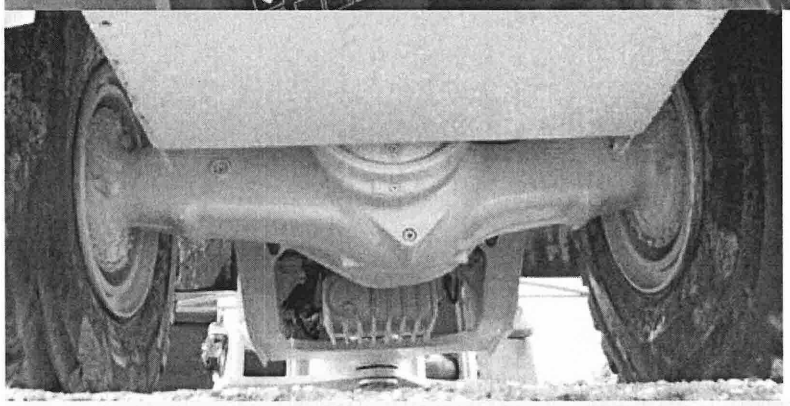
Problem-solving contronics

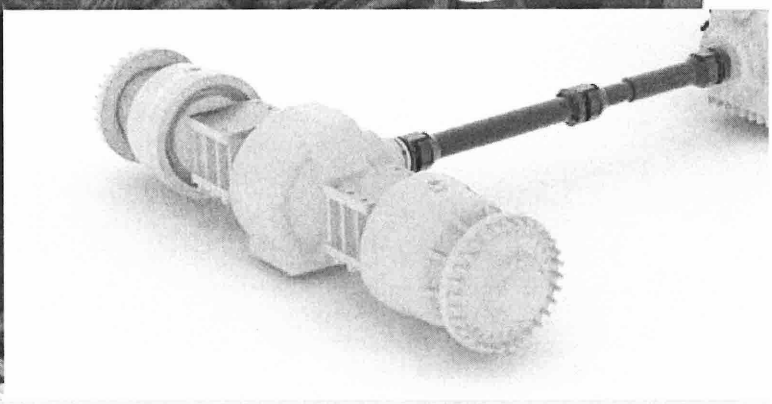
Volvo contronics is a computerized system that continuously monitors the machine's operation and performance in real time, so you don't have to. Contronics relays necessary diagnostics to the operator via a screen. The information panel provides warning messages so problems can be found early to reduce down-time and improve safety.

Tier 4 Interim engine

Volvo's 13 litre, 6-cylinder turbocharged diesel engine is efficient and environmentally responsible, with low emission levels that meet Tier 4 Interim engine requirements. Fuel consumption is lowered by a high pressure unit injector system, cooled exhaust, gas recirculation and particulate filter with active regeneration. High torque at low engine speeds with fast engine response is achieved for industry-leading performance.







Rear axle cradles

The rear axle cradles are maintenance free. Front-axle bridge connects the axle to the frame and includes two grease-lubricated-for-life roller bearings. Rear bridge includes oil bath, pre-filled-for-life bushings. Cradle oscillation pins are sealed to keep grease/oil in and dirt out for easy maintenance.

Heavy duty axles – outboard wet disc brakes and planetaries

Volvo's heavy-duty wet brake axles promote a longer service life. Axle housings absorb all loads from the machine weight distribution, so the axle shafts only transmit torque to the hub reductions, which reduces working stresses on the propeller and axle shafts.

PRECISION AT YOUR FINGERTIPS.

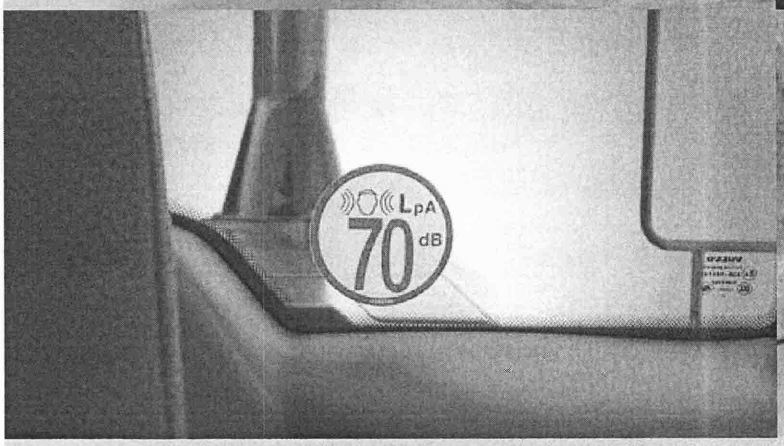
As every operator knows, space matters – particularly the one in your cab. Volvo provides a premium operator environment with excellent visibility, ample room and easy-access controls. In the safe, quiet space, operators feel focused, efficient and in control – every time they work.

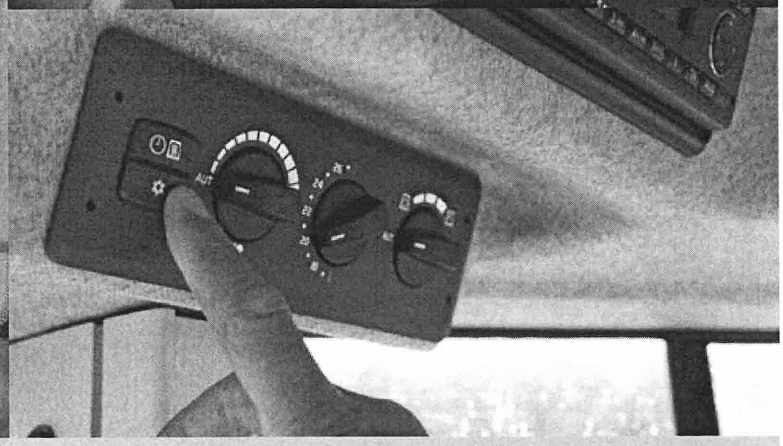
Air filter

Take a deep breath; Volvo provides a world-class cab climate. The cab air intake is placed in a prime location – high on the machine, where the air is cleaner and further from outside dust. The easy-to-replace pre-filter separates coarse dust. Industry leading cab filtration with up to 98% filter efficiency.

Electro Hydraulic Servo Control

The servo controls are mounted on the operator seat, to keep them in place despite seat movement. The high quality controls allow the selection of easy settings from inside the cab such as: return to dig, boom and bucket detent.





Noise reduction

One of the quietest cabs in the industry.

Automatic climate control

No matter what the weather does, Volvo keeps the operator at a pre-selected temperature with its in-cab climate control system.

Industry-leading cab

The Volvo cab is industry-tested and approved according to ROPS/FOPS. Safety is at the forefront of design alongside excellent all-round visibility. The cab is spacious allowing ample room to stretch out your legs and still have room for storage.

Z-bar linkage

The L250G features a powerful modified Z-Bar loader linkage that allows for high breakout force for digging in hard materials. Its heavy-duty linkage, lift arms and cylinders also offer high lift capacity and rapid hydraulic reaction, resulting in faster work cycles.

LOADED WITH INNOVATION.

Eco pedal

Mechanical counter pressure encourages fuel-saving with the accelerator pedal.

Industry-leading cab

Roomy, ROPS/FOPS tested cab with conveniently-placed controls and industry-leading air filtration system.

Engine

Volvo's efficient 13 litre, 6-cylinder turbocharged diesel engine gives you more power, while consuming less fuel.

New hood design

New electronic opening design for easy service access. Bigger ventilation panels keep the engine cool.

Heavy-duty axles

Volvo's heavy-duty wet brake axles promote a longer service life. Axle housings absorb all loads from the machine weight distribution, so the axle shafts only transmit torque to the hub reductions, which reduces working stresses on the propeller and axle shafts.

Automatic Power Shift

The machine always operates in the most suitable gear according to speed, kick down and engine braking to save fuel consumption.

Electro servo controls

Mounted on the cab seat for comfortable operation and control.

Designed for productivity

Designed to match the needs of on-highway trucks, the L250G is purpose built to be a heavy-duty machine with plenty of power and features larger bucket sizes. In North America specifically, when loading triaxle on-highway trucks, a new 9.0 cubic yard rehandling bucket quickly fills the truck in only two passes – two full buckets for one full truck.

CareTrack

Standard telematics to remotely guide machine owners towards optimized productivity and service needs.

Purpose built drivetrain

Engine, transmission, axles, hydraulics and steering are developed as one unit by Volvo to provide optimized performance and maximum reliability.

Load-sensing hydraulics

Variable- flow axial piston pumps for superior control and lifting speed.

Z-bar linkage

The L250G features a powerful modified Z-Bar loader linkage that allows for high breakout force for digging in hard materials. Its heavy-duty linkage, lift arms and cylinders also offer high lift capacity and rapid hydraulic reaction, resulting in faster work cycles.

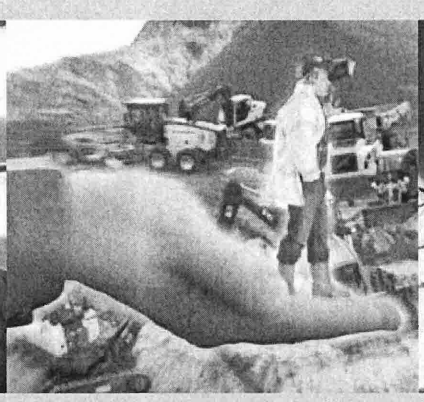
Productive Optishift

Includes torque converter with Lock-Up and Reverse By Brake for lower fuel consumption in most applications.

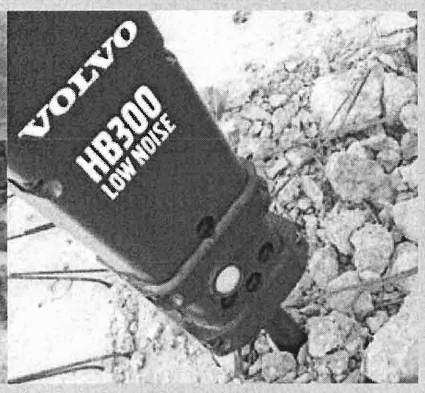
STRENGTH TO SUPPORT YOU AND YOUR BUSINESS.

The day you receive your new Volvo Wheel Loader is just the start of your working relationship with Volvo. From service and maintenance to our CareTrack telematics system – Volvo has a comprehensive and sophisticated aftermarket portfolio to continuously add value to your business.

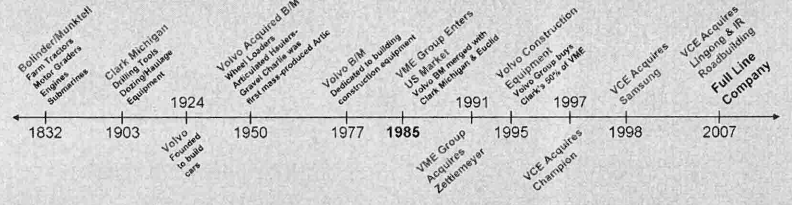
CareTrack - Volvo's telematics system works with our exclusive machine tracking info system, MATRIS, using guided diagnostics to track and analyze machines remotely - minimizing costs and maximizing uptime.



Customer Support Agreements - Gives you peace of mind by reducing total ownership costs, maximizing uptime, and distributing maintenance and major repair costs.



Attachments - Providing customers with a wide variety of attachments keep your machine working and open up new job opportunities.



Volvo designed and built your machines, so no-one knows how to keep them working in top condition more than us. When it comes to your machine, our Volvo trained technicians are the experts.

Our technicians work with industry leading diagnostic tools and techniques, using only Genuine Volvo Parts to deliver the highest levels of quality and service. Talk to your Volvo dealer about how genuine Volvo services can best provide the service and maintenance plan that is the right fit for you and your business.

State-of-the-art machines require state-of-the-art support and your Volvo dealer can provide a catalogue of services designed to get the most out of your machine, helping you maximise uptime, productivity and residual value. Your Volvo dealer can provide a number of sophisticated support offers, including:

Service plans ranging from routine wear inspections, through to comprehensive maintenance and repair agreements.

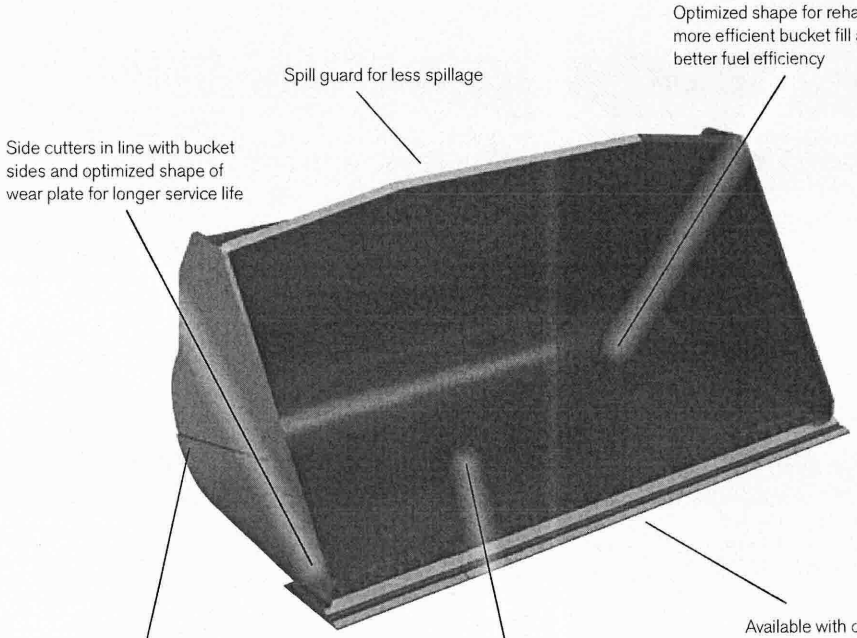
Analysis and diagnostics to help you understand how your machine is running, highlight potential maintenance issues and identify where performance can be improved.

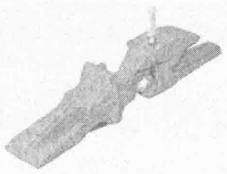
Eco Operator training courses can help your operators work towards a safer, more productive and fuel efficient performance.

CONNECT AND GO.

All genuine Volvo attachments are purpose-built with the same quality as the rest of the machine. They're designed as an integrated part of the wheel loader for which they were intended, their functions and properties perfectly matched to parameters such as link-arm geometry and breakout, rim pull and lifting force. That's why the machine and attachment work in perfect harmony, forming a dependable cohesive unit to get the job done – safely and efficiently.

Rehandling buckets increase fuel efficiency:





Volvo Tooth system

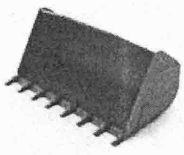
The Volvo patented vertical locking device makes mounting and removing fast and easy. For Volvo buckets there are a also wide selection of cutting edges and segments in high strength steel 500 HB to protect the bucket from wear.

Spade nose rock bucket with teeth

- For high penetration force

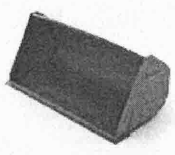
Straight edge rock bucket with teeth

- For typical penetration force



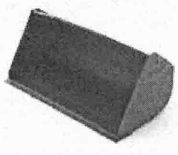
Rehandling bucket with teeth

- For loading settled, dense stock piles



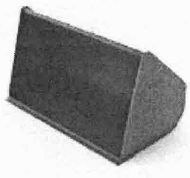
8.0 yd³ (6.1 m³) Rehandling bucket with bolt-on edge

- For material with high density



9.0 yd³ (6.9 m³) Rehandling bucket with bolt-on edge

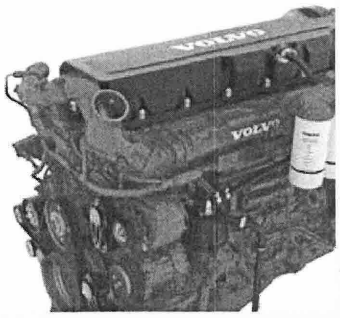
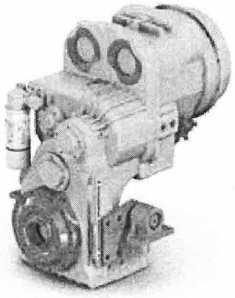
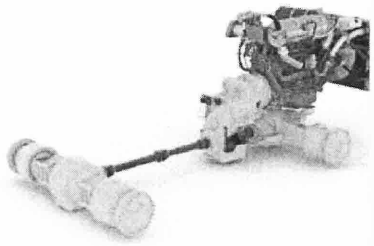
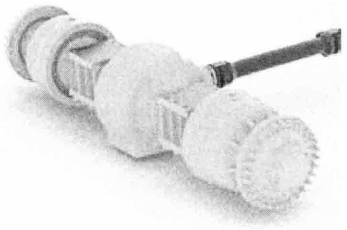
- Ideal for two pass loading into triaxle on-highway trucks



Light material bucket with bolt-on edge

- For mulch and low density materials

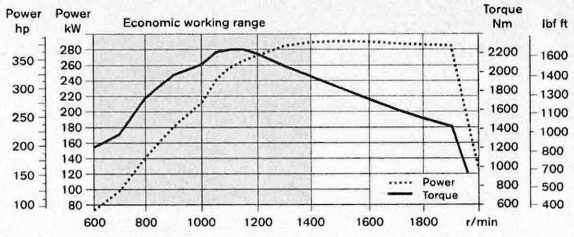
VOLVO L250G IN DETAIL.

Engine

V-ACT Tier 4i, 13 liter, 6-cylinder straight turbocharged diesel engine with 4 valves per cylinder, overhead camshaft and electronically controlled unit injectors. The engine has wet replaceable cylinder liners and replaceable valve guides and valve seats. The throttle applications is transmitted electrically from the throttle pedal or the optional hand throttle. **Air cleaning:** Two-stage Cyclone pre-cleaner - primary filter -secondary filter. **Cooling system:** Hydrostatic, electronically controlled fan and intercooler of the air-to-air type.

Engine		D13H-E (Tier 4i)
Max power at	r/s (r/min)	25,0 (1500)
SAE J1995 gross	kW / hp	291 / 390
ISO 9249, SAE J1349 net	kW / hp	290 / 389
Max torque at	r/s (r/min)	18,3 (1100)
SAE J1995 gross	Nm / lbf-ft	2231 / 1646
ISO 9249, SAE J1349 net	Nm / lbf-ft	2216 / 1634
Economic working range	r/s (r/min)	13,3-26,6 (800-1600)
Displacement	l / in³	12,8 / 781



Brake system

Service brake: Volvo dual-circuit system with nitrogen-charged accumulators. Outboard-mounted fully hydraulic operated, fully sealed oil circulation-cooled wet disc brakes. The operator can select automatic declutch of the transmission when braking by a switch on the instrument panel.
Parking brake: Fully sealed, wet multi-disc brake built into the transmission. Applied by spring force, electro-hydraulic release with a switch on the instrument panel.
Secondary brake: Dual brake circuits with rechargeable accumulators. One circuit or the parking brake fulfills all safety requirements.
Standard: The brake system complies with the requirements of ISO 3450.

Electrical system

Central warning system: Contronic electrical system with central warning light and buzzer for following functions: - Serious engine fault - Low steering system pressure - Over speed warning engine - Interruption in communication (computer fault) Central warning light and buzzer with the gear engaged for the following functions. - Low engine oil pressure - High engine oil temperature - High charge air temperature - Low coolant level - High coolant temperature - High crank case pressure - Low transmission oil pressure - High transmission oil temperature - Low brake pressure - Engaged parking brake - Fault on brake charging - Low hydraulic oil level - High hydraulic oil temperature - Overspeeding in engaged gear - High brake cooling oil temperature front and rear axles.

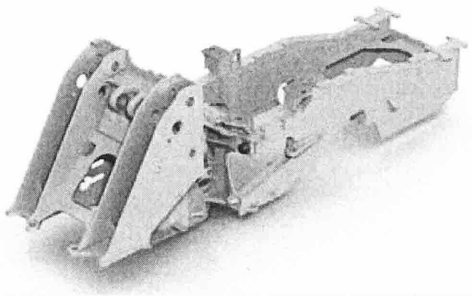
Voltage	V	24
Batteries	V	2 x 12
Battery capacity	Ah	2 x 170
Cold cranking capacity, approx.	A	1000
Alternator rating	W/A	2280/80
Starter motor output	kW (hp)	7,0 (9.4)

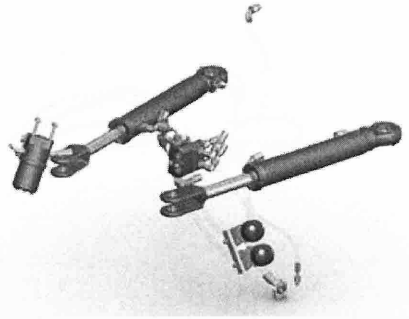
Drivetrain

Torque converter: Single-stage with lock-up clutch.
Transmission: Volvo countershaft transmission. Fast and smooth shifting of gears with Pulse Width Modulation (PWM) valve. Torque converter with lockup.
Transmission: Volvo Automatic Power Shift (APS) with fully automatic shifting 1-4 and mode selector with 4 different gear shifting programs, including AUTO.
Axles: Volvo fully floating axle shafts with planetary hub reductions and nodular iron axle housing. Fixed front axle and oscillating rear axle. 100% differential lock on the front axle.

Transmission			Volvo HTL 307
Torque multiplication			2,094:1
Maximum speed, forward/reverse	1st gear	km/h(mph)	7,0 (4.3)
	2nd gear	km/h(mph)	11,5 (7.1)
	3rd gear	km/h(mph)	24,5 (15.2)
	4th gear*	km/h(mph)	38,0 (23.6)
Measured with tires			29.5 R25 L4
Front axle/rear axle			Volvo/AWB 50/41
Rear axle oscillation ±		°	15
Ground clearance at 15° osc.		mm (in)	600 (23.6)

*) limited by ECU





Cab

Instrumentation: All important information is centrally located in the operator's field of vision. Display for Contronic monitoring system.
Heater and defroster: Heater coil with filtered fresh air and fan with auto and 11 speeds. Defroster vents for all window areas.
Operator's seat: Operator's seat with adjustable suspension and retractable seatbelt. The seat is mounted on a bracket on the rear cab wall and floor. The forces from the retractable seatbelt are absorbed by the seat rails.
Standard: The cab is tested and approved according to ROPS (ISO 3471), FOPS (ISO 3449). The cab meets with requirements according to ISO 6055 (Operator overhead protection - Industrial trucks) and SAE J386 ("Operator Restraint System").

Sound level in cab according to ISO 6396/SAE J2105		
LpA	dB(A)	74 / 70
External sound level according to ISO 6395/SAE J2104		
LwA	dB(A)	111 / 109
Ventilation	m^3 (ft^3/min)	9 (318)
Heating capacity	kW (hp)	16 (214)
Air conditioning (optional)	kW (hp)	7,5 (10.1)

Lift arm system

Z-bar

Lift cylinders		2
Cylinder bore	mm (in)	190 (7.5)
Piston rod diameter	mm (in)	100 (3.9)
Stroke	mm (in)	873 (34.4)
Tilt cylinder		1
Cylinder bore	mm (in)	220 (8.7)
Piston rod diameter	mm (in)	120 (4.7)
Stroke	mm (in)	570 (22.4)

Steering system

Steering system: Load-sensing, hydrostatic articulated steering.
System supply: The steering system has priority feed from a load-sensing axial piston pump with variable displacement.
Steering cylinders: Two double-acting cylinders.

Cylinder bore	mm (in)	100 (3.9)
Piston rod diameter	mm (in)	60 (2.4)
Stroke	mm (in)	525 (20.7)
Working pressure	MPa (bar)	21 (210)
Maximum flow	l (gal)/min	202 (53.4)
Maximum articulation	± °	37

Hydraulic system

System supply: Two load-sensing axial piston pumps with variable displacement. The steering system always has priority.
Valves: Double-acting 2-spool valve. The main valve is controlled by a 2-spool pilot valve.
Lift function: The valve has three positions; raise, hold and lower position. Inductive/magnetic automatic boom kickout can be switched on and off and is adjustable to any position between maximum reach and full lifting height from inside cab.
Tilt function: The valve has three functions including rollback, hold and dump. Inductive/magnetic automatic tilt can be adjusted to the desired bucket angle from inside the cab.
Cylinders: Double-acting cylinders for all functions.
Filter: Full flow filtration through 10 micron (absolute) filter cartridge.

Working pressure maximum, pump 1	MPa (bar)	29 (290)
Flow	l (gal)/min	252 (66.6)
at	MPa (bar)	10 (100)
engine speed	r/s (r/min)	32 (1900)
Working pressure maximum, pump 2	MPa (bar)	31 (310)
Flow	l (gal)/min	202 (53.4)
at	MPa (bar)	10 (100)
engine speed	r/s (r/min)	32 (1900)
Working pressure maximum, pump 3	MPa (bar)	25 (250)
Flow	l (gal)/min	83 (22)
at	MPa (bar)	10 (100)
engine speed	r/s (r/min)	32 (1900)
Pilot system, working pressure	MPa (bar)	3,2-4,0 (32-40)
Cycle times		
Lift	s	7,1
Tilt*	s	1,9
Lower, empty	s	4,1
Total cycle time	s	13,1

Service

Service accessibility: Large, easy-to-open hood covering whole engine compartment, electrically operated. Fluid filters and component breather air filters promote long service intervals. Possibility to monitor, log and analyze data to facilitate troubleshooting.

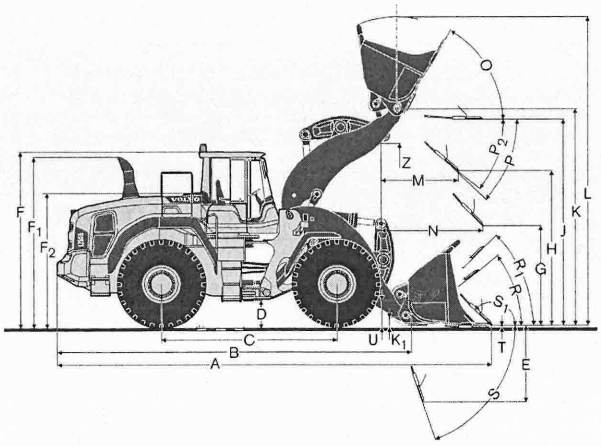
Fuel Tank	l (gal)	335 (88.5)
Engine coolant	l (gal)	46 (12.2)
Hydraulic oil tank	l (gal)	226 (41.2)
Transmission oil	l (gal)	48 (12.7)
Engine oil	l (gal)	50 (13.2)
Axle oil front/rear	l (gal)	77/71 (20.3/18.8)

SPECIFICATIONS.

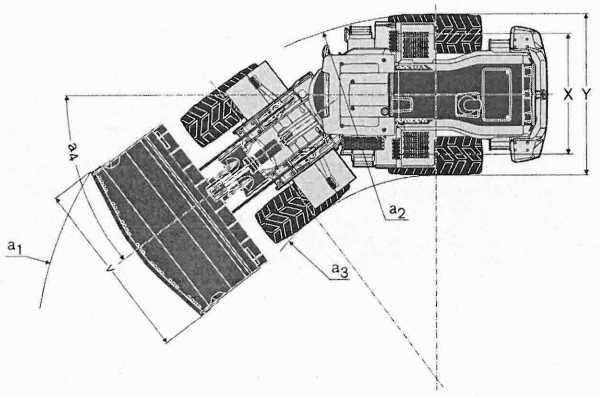
Tires L250G: 29.5 R25 L4

		Standard boom	Long boom
A	mm (ft in)	9250 (30' 3")	9557 (31' 3')
B	mm (ft in)	7530 (24' 7")	7800 (25' 6")
C	mm (ft in)	3750 (12' 3")	3750 (12' 3")
D	mm (ft in)	520 (1' 7")	520 (1' 7")
E	mm (ft in)	1580 (5' 2")	1612 (5' 3")
F	mm (ft in)	3720 (12' 2")	3720 (12' 2")
F_1	mm (ft in)	3610 (11' 8")	3610 (11' 8")
F_2	mm (ft in)	2830 (9' 3")	2830 (9' 3")
G	mm (ft in)	2132 (7' 0")	2132 (7' 0")
H	mm (ft in)	3290 (10' 8")	3693 (12' 1")
J	mm (ft in)	4360 (14' 3")	4721 (15' 5")
K	mm (ft in)	4620 (15' 1")	4979 (16' 3")
L	mm (ft in)	6340 (20' 8")	6695 (22' 0")
M	mm (ft in)	1540 (5' 0")	1469 (4' 8")
N	mm (ft in)	2280 (7' 5")	2479 (8' 1")
O	°	62	62
P	°	47	47
P_2	°	45	45
R	°	40	43
R_1	°	48	48
S	°	75	43
S_1	°	-317	-317
T	mm (ft in)	108 (0' 3")	176 (0' 6")
U	mm (ft in)	540 (1' 8")	540 (1' 8")
V	mm (ft in)	3580 (11' 7")	3580 (11' 7")
X	mm (ft in)	2400 (7' 9")	2400 (7' 9")
Y	mm (ft in)	3160 (10' 4")	3160 (10' 4")
Z	mm (ft in)	3920 (12' 9")	4127 (13' 5")
a_1	mm (ft in)	15 750 (51' 7")	15 750 (51' 7")
a_2	mm (ft in)	7110 (23' 3")	7110 (23' 3")
a_3	mm (ft in)	3950 (13' 0")	3950 (13' 0")
a_4	°	37	37

* Carry position SAE



Where applicable, specifications and dimensions are according to ISO 7131, SAE J732, ISO 7546, SAE J742, ISO 14397, SAE J818.



L250G

Tires 29.5 R25 L4		REHANDLING			GENERAL PURPOSE			ROCK*		LIGHT MATERIAL	LONG BOOM
Additional machine specification		8.0 yd³ STE P BOE	9.0 yd³ STE P BOE	7.6 yd³ STE P BOE	8.5 yd³ STE P T SEG	8.4 yd³ STE P T SEG	7.3 yd³ STE P T SEG	7.2 yd³ SPN P T SEG	7.8 yd³ SPN P T SEG	13.3 yd³ LM P	
Volume, heaped ISO/SAE	m³ (yd³)	6,1 (8.0)	6,9 (9.0)	5,8 (7.6)	6,5 (8.5)	6,4 (8.4)	5,6 (7.3)	5,5 (7.2)	6,0 (7.8)	10,2 (13.3)	-
Volume at 110% fill factor	m³ (yd³)	6,7 (8.8)	7,6 (9.9)	6,4 (8.4)	7,2 (9.4)	7,0 (9.1)	6,2 (8.1)	6,1 (8.0)	6,6 (8.6)	11,2 (14.6)	-
Static tipping load, straight	kg (lb)	26 930 (59,503)	26 810 (59,106)	25 390 (55,975)	25 070 (55,270)	25 170 (55,490)	26 340 (58,070)	25 870 (57,034)	25 620 (56,482)	24 250 (53,462)	-1430 (-3,153)
at 35° turn	kg (lb)	23 960 (52,823)	23 790 (52,448)	22 540 (49,692)	22 230 (49,009)	22 330 (49,229)	23 420 (51,632)	22 960 (50,596)	22 710 (50,057)	21 410 (47,201)	-1320 (-2,910)
at full turn	kg (lb)	23 610 (52,051)	23 440 (51,676)	22 210 (48,965)	21 900 (48,281)	22 010 (48,524)	23 080 (50,905)	22 620 (49,868)	22 380 (49,339)	21 090 (46,495)	-1310 (-2,888)
Breakout force	kN (lbf)	311,3 (69,983)	290,6 (65,329)	323,2 (72,668)	302,6 (68,027)	303,4 (68,207)	336,2 (75,581)	277,4 (62,382)	265,9 (59,777)	251,6 (56,562)	-27 (-6070)
A	mm (in)	9250 (364.2)	9370 (368.9)	9470 (372.8)	9660 (377.5)	9290 (365.7)	9380 (369.3)	9710 (382.3)	9800 (385.8)	9630 (379.1)	310 (12.2)
E	mm (in)	1580 (62.2)	1690 (66.5)	1780 (70.0)	1880 (74.4)	1620 (63.8)	1690 (66.5)	2000 (78.7)	2080 (81.9)	1960 (76.8)	32 (1.3)
H**)	mm (in)	3290 (129.5)	3210 (126.4)	3140 (123.6)	3060 (120.5)	3260 (128.3)	3210 (126.4)	3000 (118.1)	2940 (115.7)	3020 (118.9)	360 (14.2)
L	mm (in)	6340 (249.6)	6460 (254.3)	6310 (248.4)	6420 (252.8)	6420 (252.7)	6680 (263.0)	6570 (262.6)	6760 (266.1)	7010 (276.0)	360 (14.2)
M**)	mm (in)	1540 (60.6)	1620 (63.8)	1680 (66.1)	1760 (69.3)	1570 (61.8)	1620 (63.8)	1860 (73.2)	1910 (75.2)	1820 (71.6)	-70 (-2.7)
N**)	mm (in)	2280 (89.8)	2330 (91.7)	2360 (92.9)	2400 (94.5)	2300 (90.5)	2330 (91.7)	2470 (97.2)	2500 (98.4)	2390 (94.1)	220 (8.7)
V	mm (in)	3580 (140.9)	3580 (140.9)	3580 (140.9)	3580 (140.9)	3580 (140.9)	3580 (140.9)	3580 (140.9)	3580 (140.9)	3700 (145.7)	-
a1 clearance circle	mm (in)	15 750 (620.1)	15 800 (622.0)	15 850 (624.0)	15 910 (626.4)	15 770 (620.9)	15 820 (622.8)	15 990 (629.5)	16 030 (631.1)	16 080 (633.1)	-
Operating weight	kg (lb)	34 310 (75,641)	34 340 (75,707)	33 480 (73,811)	33 660 (74,207)	33 580 (74,031)	34 940 (77,029)	35 280 (77,779)	35 420 (78,088)	34 400 (75,839)	780 (1,720)

*) With L5 tires

**) Measured to the tip of the bucket teeth or bolt-on edge. Dump height to bucket edge. Measured at 45° dump angle. (Spade nose buckets at 42°.)

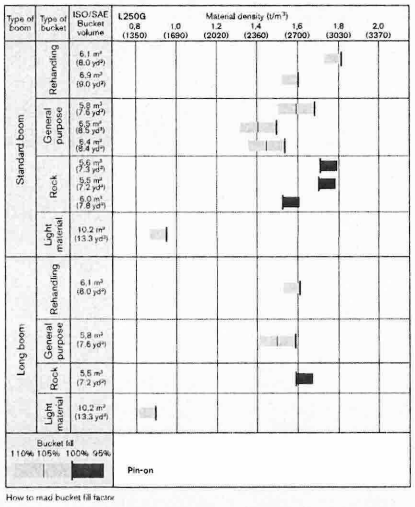
Note: This only applies to genuine Volvo attachments.

Bucket Selection Chart

The volume handled varies with the bucket fill and is often greater than indicated by the bucket's ISO/SAE volume. The table shows optimum bucket choice with regard to the material density.

Material	Bucket fill, %	Material densitiy, t/m³ (lb/yd³)
Earth	110 - 115	1,4 - 1,6 (2,360 - 2,700)
Clay	110 - 120	1,4 - 1,6 (2,360 - 2,700)
Sand	100 - 110	1,6 - 1,9 (2,700 - 3,200)
Gravel	100 - 110	1,7 - 1,9 (2,870 - 3,200)
Rock	75 - 100	1,5 - 1,9 (2,530 - 3,200)

The size of rock buckets is optimized for optimal penetration and filling capability rather than the density of the material.



How to read bucket fill factor

Supplemental Operating Data

		Standard boom		Long boom	
Tires 29.5 R25 L4		29.5 R25 L5	775/65 R29 L3	29.5 R25 L5	775/65 R29 L3
Width over tires	mm (in)	+35 (+1.4)	+95 (+3.7)	+35 (+1.4)	+95 (+3.7)
Ground clearance	mm (in)	+40 (+1.6)	-10 (-0.4)	+40 (+1.6)	-20 (-0.8)
Tipping load, full turn	kg (lb)	+1010 (+2,227)	+180 (+0,396)	+930 (+2,050)	+180 (+0,369)
Operating weight	kg (lb)	+1490 (+3,285)	+650 (+1,433)	+1500 (+3,307)	+650 (+1,433)

EQUIPMENT.

STANDARD EQUIPMENT

Service and maintenance
Engine oil remote drain and fill
Lubrication manifolds, ground accessible
Pressure check connections: transmission and hydraulic, quick-connects
Tool box, lockable
CareTrack
Telematics, 3-Year Subscription

Engine
Exhaust after-treatment system
Two stage air cleaner, pre-cleaner, primary and secondary filter
Indicator glass for coolant level
Preheating of induction air
Fuel pre-filter with water trap
Fuel filter
Crankcase breather oil trap
Exhaust heat insulation
Exterior radiator air intake protection

Electrical system
24 V, pre-wired for optional accessories
Alternator 24V/ 80A
Battery disconnect switch with removable key
Fuel gauge
Hour meter
Electric horn
Instrument cluster:
- Fuel level
- Transmission temperature
- Coolant temperature
- Instrument lighting

Lighting:
- Twin halogen front headlights with high and low beams
- Parking lights
- Double brake and tail lights
- Turn signals with flashing hazard light function
- Halogen work lights (2 front and 2 rear)

Contronic monitoring system
Monitoring and logging of machine data
Contronic display
Fuel consumption
Ambient temperature
Clock
Test function for warning and indicator lights
Brake test
Test function, sound level at max fan speed
Warning and indicator lights:
- Battery charging
- Parking brake

Warning and display message:
- Regeneration
- Engine coolant temperature
- Charge-air temperature
- Engine oil temperature
- Engine oil pressure
- Transmission oil temperature
- Transmission oil pressure
- Hydraulic oil temperature
- Brake pressure
- Parking brake applied
- Brake charging
- Over-speed at direction change
- Axle oil temperature
- Steering pressure
- Crankcase pressure
- Attachment lock open

Level warnings:
- Fuel level
- Engine oil level
- Engine coolant level
- Transmission oil level
- Hydraulic oil level
- Washer fluid level

Engine torque reduction in case of malfunction indication:
- High engine coolant temperature
- High engine oil temperature
- Low engine oil pressure
- High crankcase pressure
- High charge-air temperature

Engine shutdown to idle in case of malfunction indication:
- High transmission oil temperature
- Slip in transmission clutches

Keypad, background lit
Start interlock when gear is engaged

Drivetrain
Automatic Power Shift
Fully automatic gear shifting, 1-4
PWM-controlled gear shifting
Forward and reverse switch by hydraulic lever console
Indicator glass for transmission oil level
Differentials: Front, 100% hydraulic differential lock. Rear, conventional
OptiShift

Brake system
Dual brake circuits
Dual brake pedals
Secondary brake system
Parking brake, electrical-hydraulic, multiple discs
Brake wear indicators

Cab
ROPS (ISO 3471), FOPS (ISO 3449)
Single key kit door/start
Acoustic inner lining
Cigarette lighter, 24 V power outlet
Lockable door
Cab heating with fresh air inlet and defroster
Fresh air inlet with two filters
Automatic heat control
Floor mat
Dual interior lights
Dual interior rear-view mirrors
Dual exterior rear-view mirrors
Sliding window, right side
Tinted safety glass
Retractable seat belt (SAE J386)
Adjustable steering wheel
Storage compartment
Document pocket
Sun visor
Cup holder
Windshield washer front and rear
Windshield wipers front and rear
Interval function for front and rear wipers

Hydraulic system
Main valve, double acting 2-spool with el-hydraulic pilots
Variable displacement axial piston pumps (3) for:
1 Working hydraulic system
2 Working hydraulic system, Steering- and Brake system
3 Cooling fan and Brake system
Electro-hydraulic servo controls
Electric level lock
Boom kick-out, automatic, Boom up and RTD
Bucket positioner, automatic
Double-acting hydraulic cylinders
Indicator glass for hydraulic oil level
Hydraulic oil cooler

External equipment
Fenders, front and rear
Viscous cab mounts
Rubber engine and transmission mounts
Easy-to-open hood
Frame, joint lock
Vandalism lock prepared for
- Batteries
- Engine compartment
- Radiator grille

Lifting eyes
Tie-down eyes
Tow hitch
Counterweight, pre-drilled for optional guards

OPTIONAL EQUIPMENT

Engine
Air pre-cleaner, cyclone type
Air pre-cleaner, cyclone type, two-stage
Air pre-cleaner, oil-bath type
Air pre-cleaner, turbo type
Radiator corrosion protection
Engine auto shutdown
Engine block heater 230V/110V
ESW, Disabled engine protection
Air intake protection (for grill in waste)
Fuel fill strainer
Fuel heater
Hand throttle control
Max. fan speed, hot climate
Radiator, corrosion-protected
Reversible cooling fan
Reversible cooling fan and axle oil cooler
Fuel filter, extra

Electrical system
Alternator, 80 A with air filter
Anti-theft device
Headlights, assembly left
License plate holder, lighting
Rear view camera including monitor, color
Rear-view mirrors, adjustable, el. heated
Rear view mirrors, Long arm
Rear view mirrors, adjustable, el. heated, Long arm
Reduced function working lights, reverse gear activated
Reverse alarm
Reverse warning light, strobe lighting
Shortened headlight support brackets
Rotating beacon
Working lights, attachments
Working lights front, high intensity discharge (HID)
Working lights front, on cab, dual
Working lights front, extra
Working lights rear, on cab
Working lights rear, on cab, dual

Cab
Anchorage for Operator's manual
Automatic Climate Control, ACC
ACC control panel, with Fahrenheit scale
Asbestos dust protection filter
Cab air pre-cleaner, cyclone type
Carbon filter
Cab roof, heavy-duty
Cover plate, under cab
Lunch box holder
Armrest, operator's seat, ISRI, left only
Operator's seat, KAB, air susp, heavy-duty, for CDC and/or elservo
Operator's seat, ISRI, air susp, heat, high back
Radio installation kit including 11 amp 12 volt outlet, left side
Radio installation kit including 11 amp 12 volt outlet, right side
Radio installation kit including 20 amp 12 volt outlet
Radio with CD-player
Seat belt, 3", (width 75 mm)
Steering wheel knob
Sun blinds, rear windows
Sun blinds, side windows
Timer cab heating
Window, sliding, door
Universal door/ignition key
Front view mirror

Drivetrain
Differential lock front 100%, Limited Slip rear
Speed limiter, 20 km/h
Speed limiter, 30 km/h
Wheel/axle seal guards

Brake system
Oil cooler and filter front & rear axle

Hydraulic system
Boom suspension system
Separate attachment locking, standard boom
Separate attachment locking, long boom
Arctic kit, attachment locking hoses and 3rd hydraulic function
Arctic kit, pilot hoses and brake accum. including hydraulic oil
Boom cylinder hose and tube guards
Boom cylinder hose and tube guards for long boom
Hydraulic fluid, biodegradable, Volvo
Hydraulic fluid, fire-resistant
Hydraulic fluid, for hot climate
Electro-hydraulic function, 3rd
Electro-hydraulic function, 3rd for long boom
Electro-hydraulic function, 3rd-4th
Electro-hydraulic function, 3rd-4th for long boom
Electro-hydraulic servo controls for long boom

External equipment
Cab ladder, rubber-suspended
Deleted front mudguards
Mudguard widener, front/rear for 80-series tires
Mudguard widener, front/rear for 65-series tires
Fire suppression system
Mudguards, full cover, rear for 80-series tires
Mudguards, full cover, rear for 65-series tires
Long boom
Long boom for electro-hydraulic

Protective equipment
Belly guard front
Belly guard rear
Belly guard rear, oil pan
Cover plate, heavy-duty, front frame
Cab roof heavy duty
Guards for front headlights
Guards for radiator grill
Guards for tail lights
Windows, side and rear guards
Windshield guard
Corrosion protection, painting of machine

Other equipment
CE-marking
Comfort Drive Control (CDC)
Counterweight, logging
Counterweight, re-handling
Counterweight, signal painted, chevrons
Secondary steering with automatic test function
Sound decal
Noise reduction kit, exterior
CareTrack, GSM
CareTrack, GSM/Satellite

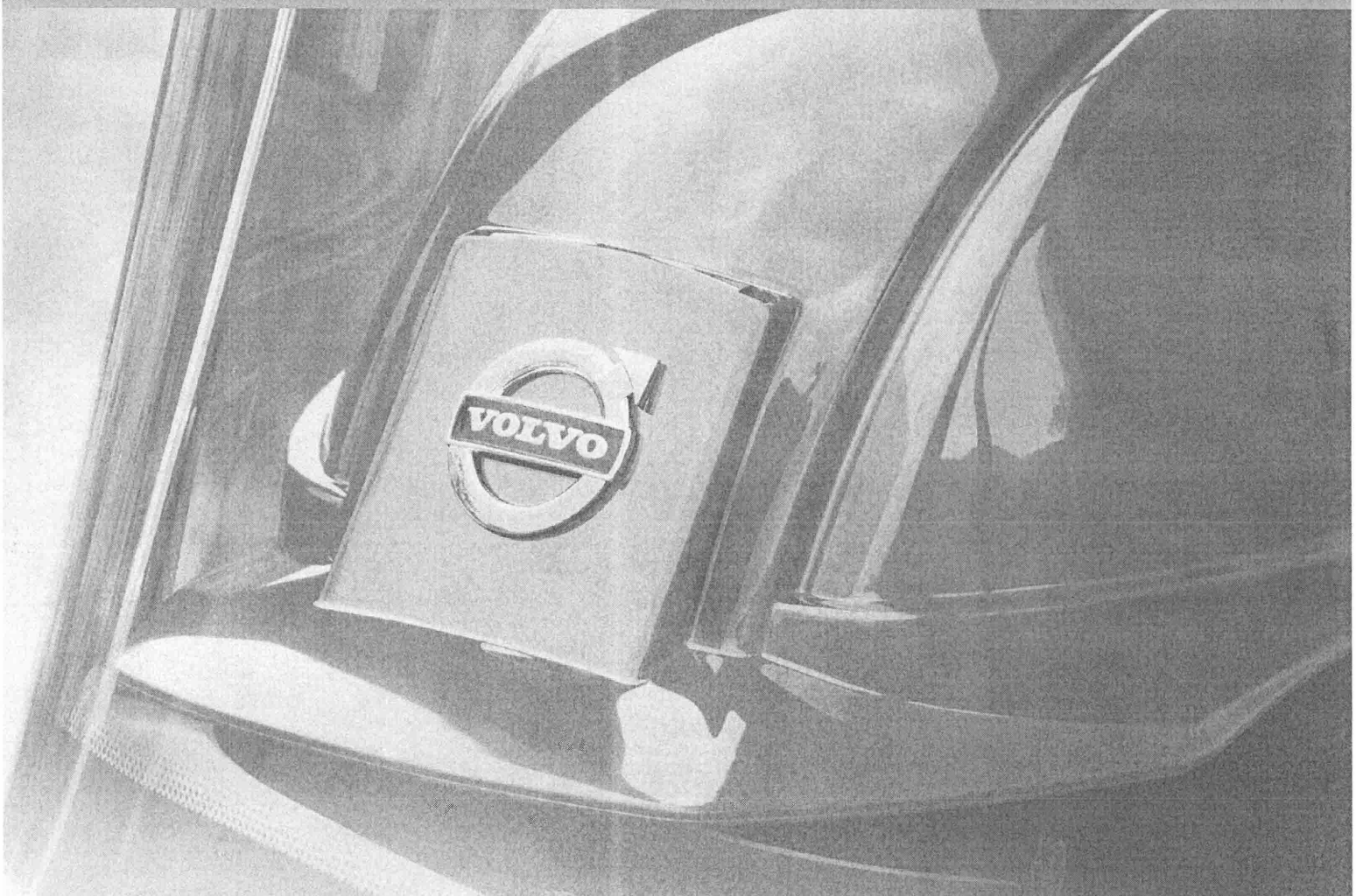
Tires
29.5 R25
875/65 R29

Service and maintenance
Automatic lubrication system
Automatic lubrication system for long boom
Grease nipple guards
Oil sampling valve
Refill pump for grease to lube system
Tool kit
Wheel nut wrench kit

Attachments
Buckets:
- Rock straight or spade nose
- General purpose
- Re-handling
- Light material

Wear parts:
- Bolt-on and weld-on bucket teeth
- Segments
- Cutting edge in three sections, bolt-on

VOLVO CONSTRUCTION EQUIPMENT



Volvo Construction Equipment is different. Our machines are designed, built and supported in a different way. That difference comes from an engineering heritage of over 175 years. A heritage of thinking first about the people who actually use the machines. About how to help them be safer, more comfortable, more productive. About the environment we all share. The result of that thinking is a growing range of machines and a global support network dedicated to helping you do more. People around the world are proud to use Volvo. And we're proud of what makes Volvo different.

VOLVO

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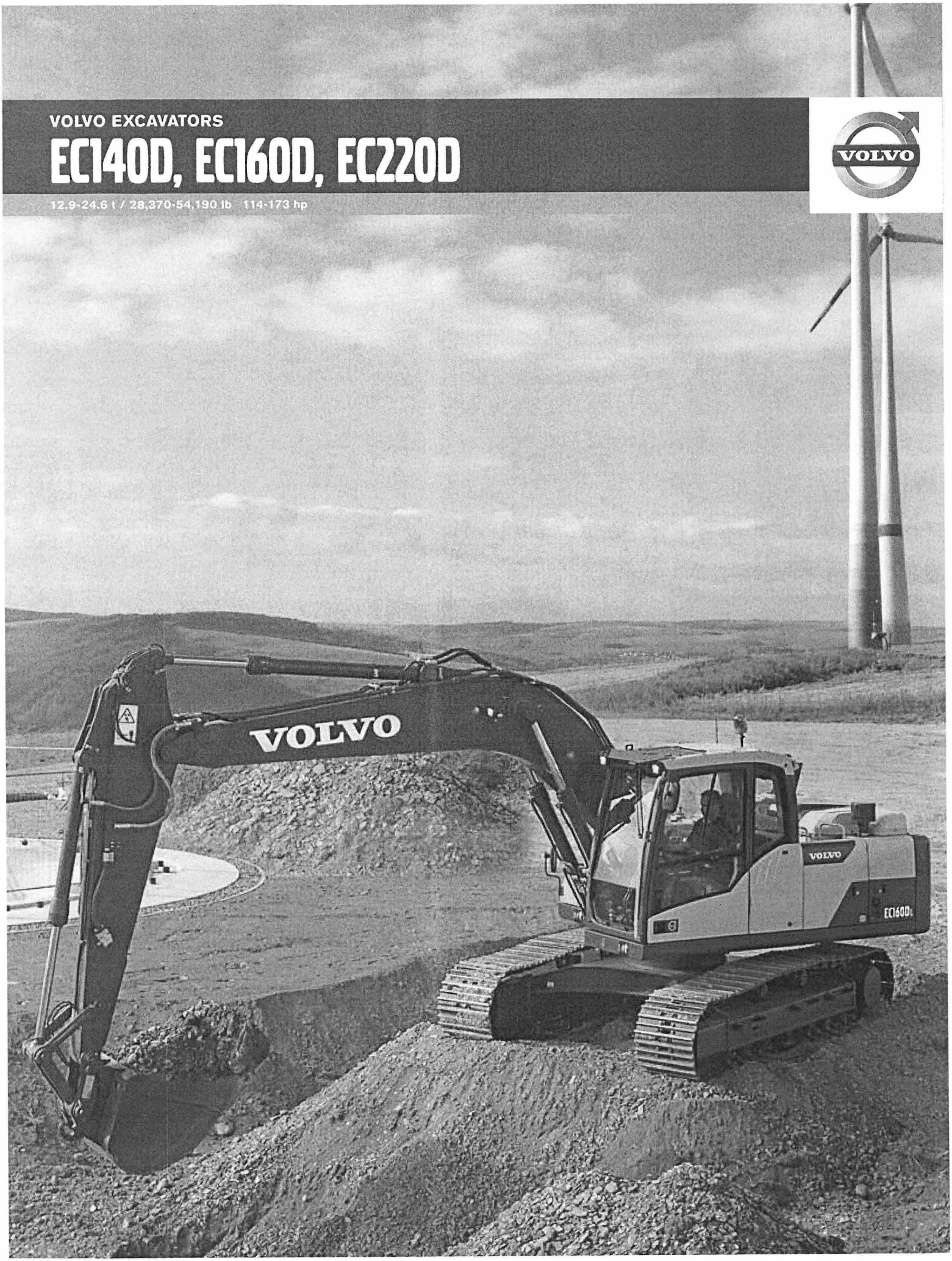
USA

EXHIBIT 13

VOLVO EXCAVATORS

EC140D, EC160D, EC220D

12.9-24.6 t / 28,370-54,190 lb 114-173 hp



A PASSION FOR PERFORMANCE.

At Volvo Construction Equipment, we're not just coming along for the ride. Developing products and services that raise productivity – we are confident we can lower costs and increase profits for industry experts. Part of the Volvo Group, we are passionate about innovative solutions to help you work smarter – not harder.

Helping you to do more

Doing more with less is a trademark of Volvo Construction Equipment. High productivity has long been married to low energy consumption, ease of use and durability. When it comes to lowering life-cycle costs, Volvo is in a class of its own.

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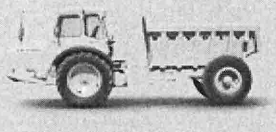
There is a lot riding on creating solutions that are suited to the particular needs of different industry applications. Innovation often involves high technology – but it doesn't always have to. Some of our best ideas have been simple, based on a clear and deep understanding of our customers' working lives.



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Over the years, Volvo has advanced solutions that have revolutionized the use of construction equipment. No other name speaks Safety louder than Volvo. Protecting operators, those around them and minimizing our environmental impact are traditional values that continue to shape our product design philosophy.

We're on your side

We back the Volvo brand with the best people. Volvo is truly a global enterprise, one that is on standby to support customers quickly and efficiently – wherever they are.

We have a passion for performance.

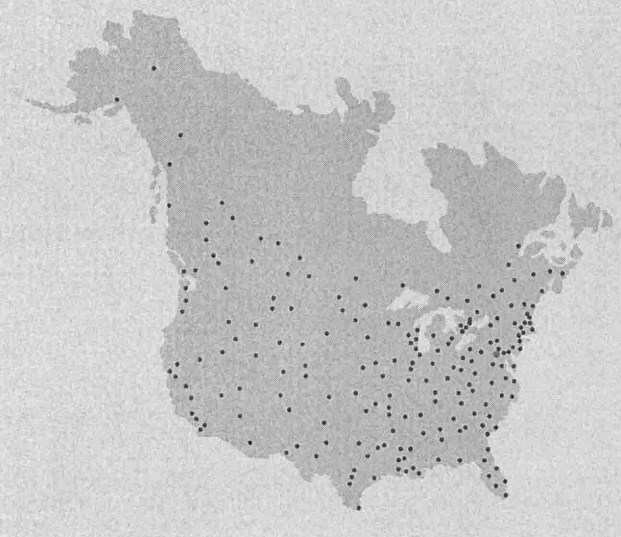
A strong, dedicated, capable dealer network.

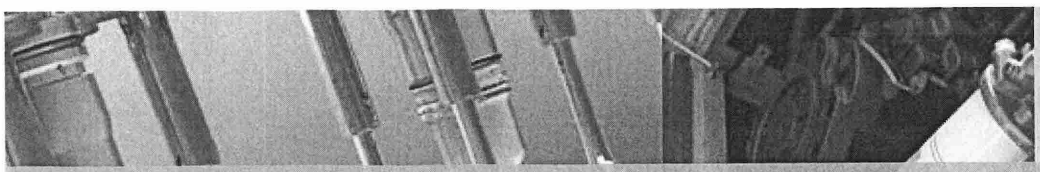
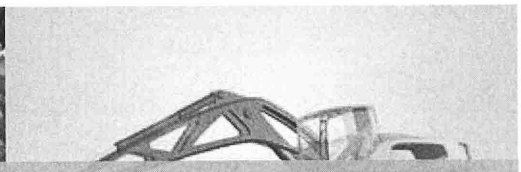
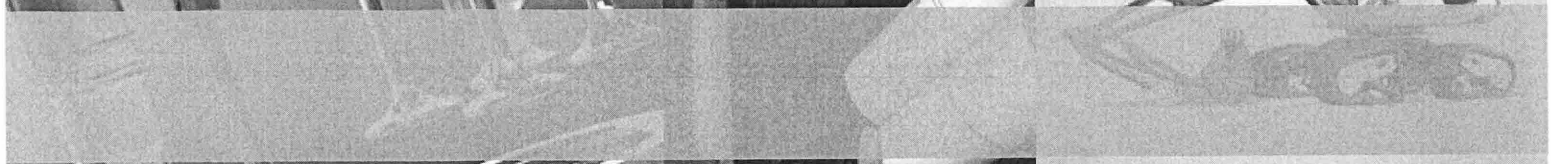
Our dealers are strategically located throughout North America to provide the equipment you need and the parts and service support you demand for a productive and profitable operation.

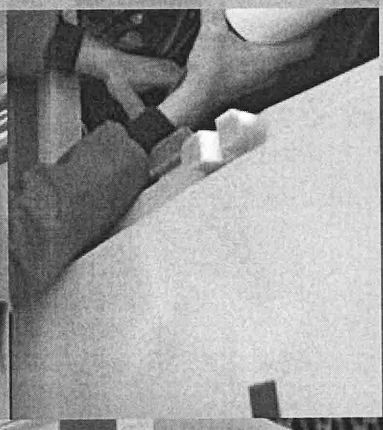
The strength of our dealer network is enhanced with extensive individualized product and product support training at our state-of-the-art Technical Training Center in Asheville and through hands-on training. At our nearby 80-acre Product Demonstration Center, visitors operate equipment from our entire product line under a variety of simulated working conditions. Both facilities are in year-round use by our dealers and customers – more than 2,000 visit each year. **Building the best starts right here.**

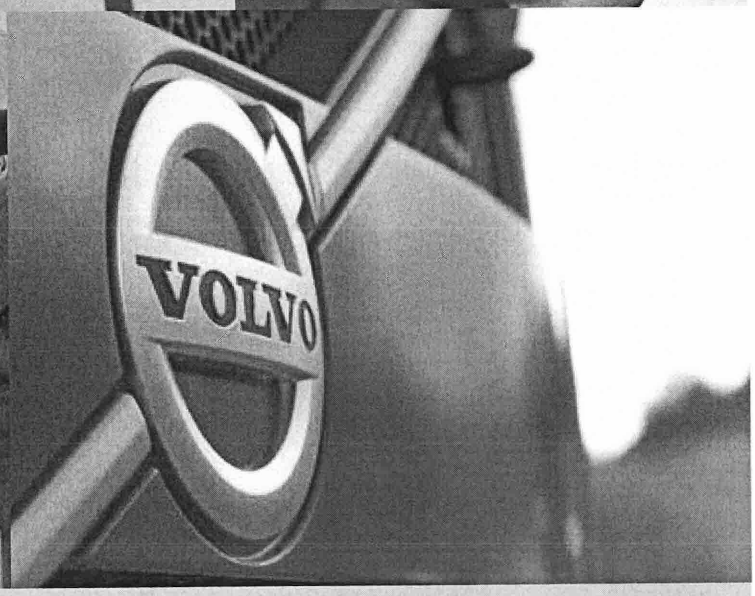
The products designed and manufactured by Volvo Construction Equipment have their beginnings at the most advanced Research & Design centers in the industry. Volvo CE machines are designed in 11 R&D centers and produced in 15 manufacturing facilities across the world.

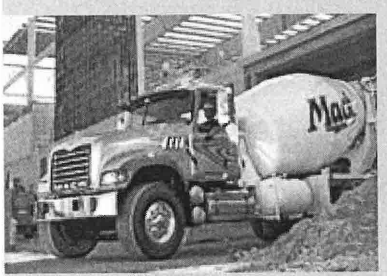
The major R&D center and manufacturing plant in the Americas is located in Shippensburg, Pennsylvania. This facility has been in operation for over 30 years and – with its recently added 200,000 sq ft expansion – now covers 570,000 sq ft on an 80 acre campus. Dedicated work teams and highly advanced technologies and techniques using the Volvo Production System ensure continuous quality improvements, labor savings and cost control to reach the high quality that our customers have come to expect from Volvo.







Mack Trucks

Volvo Construction Equipment

Volvo Penta

Volvo Trucks

Renault Trucks

UD Trucks

Volvo Buses

Volvo Aero

Volvo Financial Services

DESIGNED FOR EFFICIENCY.

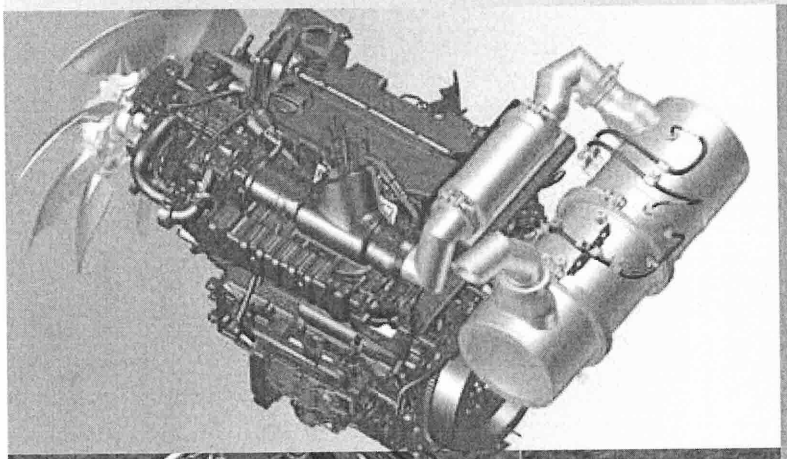
Introducing Volvo's powerful, fuel efficient and environmentally responsible D-Series crawler excavators. Featuring Volvo's unique, award-winning ECO mode, the Tier 4 Interim engine and improved hydraulics, these machines deliver reduced fuel consumption and cycle times resulting in fuel efficiency improvements as well as increased digging performance.

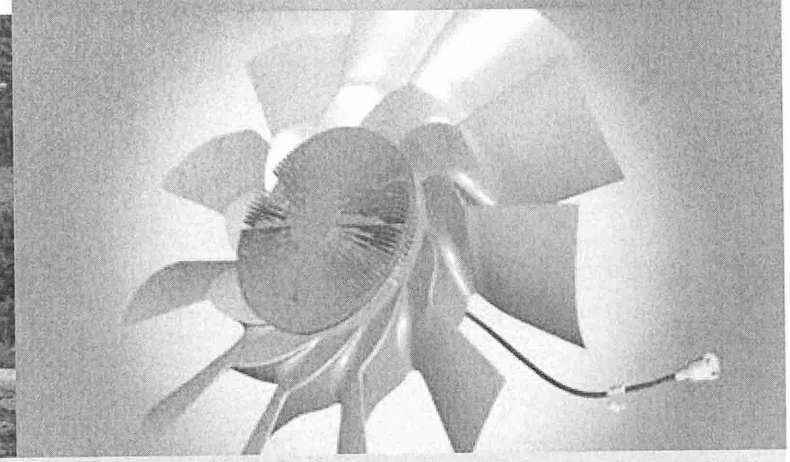
Volvo Tier 4 Interim engine

Volvo's new fuel efficient engine features an active-type Diesel Particulate Filter (DPF) and a regeneration process to lower emissions. The unique method does not interrupt operation, performance or productivity.

ECO mode

Volvo's unique, award-winning ECO mode features sophisticated electronic pump control technology which contributes to up to 5% of the machine's total improved fuel efficiency without any loss of performance in most operating conditions.





Work modes

Operators can select the best work mode for the task at hand to ensure optimum performance and fuel efficiency. Choose the correct mode according to your working conditions for added versatility and increased performance.

Proportional controlled viscous-clutch

Optimized fan speed control from the new proportional controlled viscous-clutch for reduced fuel consumption.

CONTROL IT. FASTER.

Volvo gives you more. More power, more capacity and more weight – command the new D-Series crawler excavators to handle your workload and enjoy increased total performance from our improved hydraulic system. Trust Volvo to put you in control.

Controllability

Smart hydraulic system enables smooth and highly responsive combined operation and travel. The system automatically prioritizes oil flow to the boom, arm or slew function according to requirements, resulting in faster cycle times.

Digging power and speed

Enhanced digging performance and faster cycle times, particularly when working with hard materials, from increased engine power and improved hydraulics.

Lifting capacity

Excellent lifting capacity and stability allows the machine to lift heavier objects ensuring greater productivity.

Grading

Superb grading performance from improved hydraulic system. Effortlessly smooth surfaces with harmonized flow control and well-matched attachment speed.

Attachment Management System

Allows storage of up to 18 different attachment presets and permits hydraulic flow (standard) and pressure (optional) to be adjusted to enable the use of various attachments for increased versatility. Operators can change attachments quickly without manual setup.

CONTROL IN COMFORT.

Volvo Care Cab

All-round visibility and a premium operator environment are at the heart of Volvo's cab design. The spacious cab, with ample storage and leg room, features an adjustable seat for excellent operator comfort, reduced whole body vibration and increased productivity.

Step inside Volvo's care cab and enjoy excellent all-round visibility. In this safe and comfortable environment operators will feel efficient and in control all day long. See more and do more with Volvo.

Rubber/Silicone oil viscous mounts

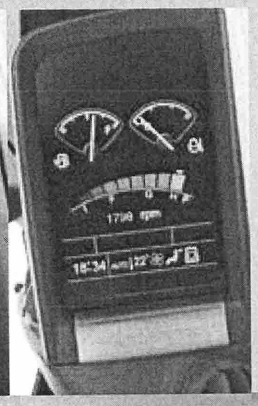
Spring is added to the mounts to improve shock absorption and reduce vibration. Increased operator comfort means more productivity.

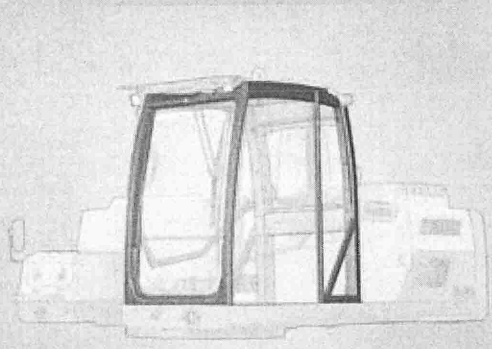
I-ECU monitor

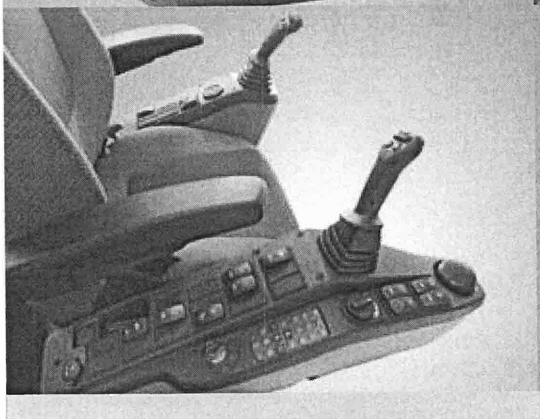
Large color monitor provides excellent clarity in all light conditions. Using a control panel the operator and service technician can make quick visual and diagnostic checks, increasing uptime and productivity. The monitor also displays camera images – up to four at a time.

ROPS

The cab features Roll Over Protective Structure (ROPS) which meets the ISO 12117-2 safety standard for increased peace of mind in the unlikely event of machine roll over.







Smart consoles and switches

High quality consoles and conveniently located switches for easy access and improved operator efficiency.

Automatic climate control system

Operators can set their ideal temperature with Volvo's powerful climate control system. Industry leading air circulation and defrosting capability is delivered with 14 well-spaced vents for increased comfort and productivity.

Rear view camera

Rear view camera provides visibility via the color I-ECU monitor for increased safety. The camera sits on top of the counterweight to project the area behind the machine.

SERVICEABILITY. SIMPLIFIED.

With built in serviceability the new Volvo D-Series crawler excavators guarantee you more uptime. Easy access to grouped service points allows for fast and effortless maintenance and service checks. Achieve more with Volvo.

Serviceability

Grouped filters and accessible radiators are quick to access from ground level via large, wide compartment doors – increasing safety. Easy access for maintenance means regular checks get done faster, giving you more uptime.

Grouped filters

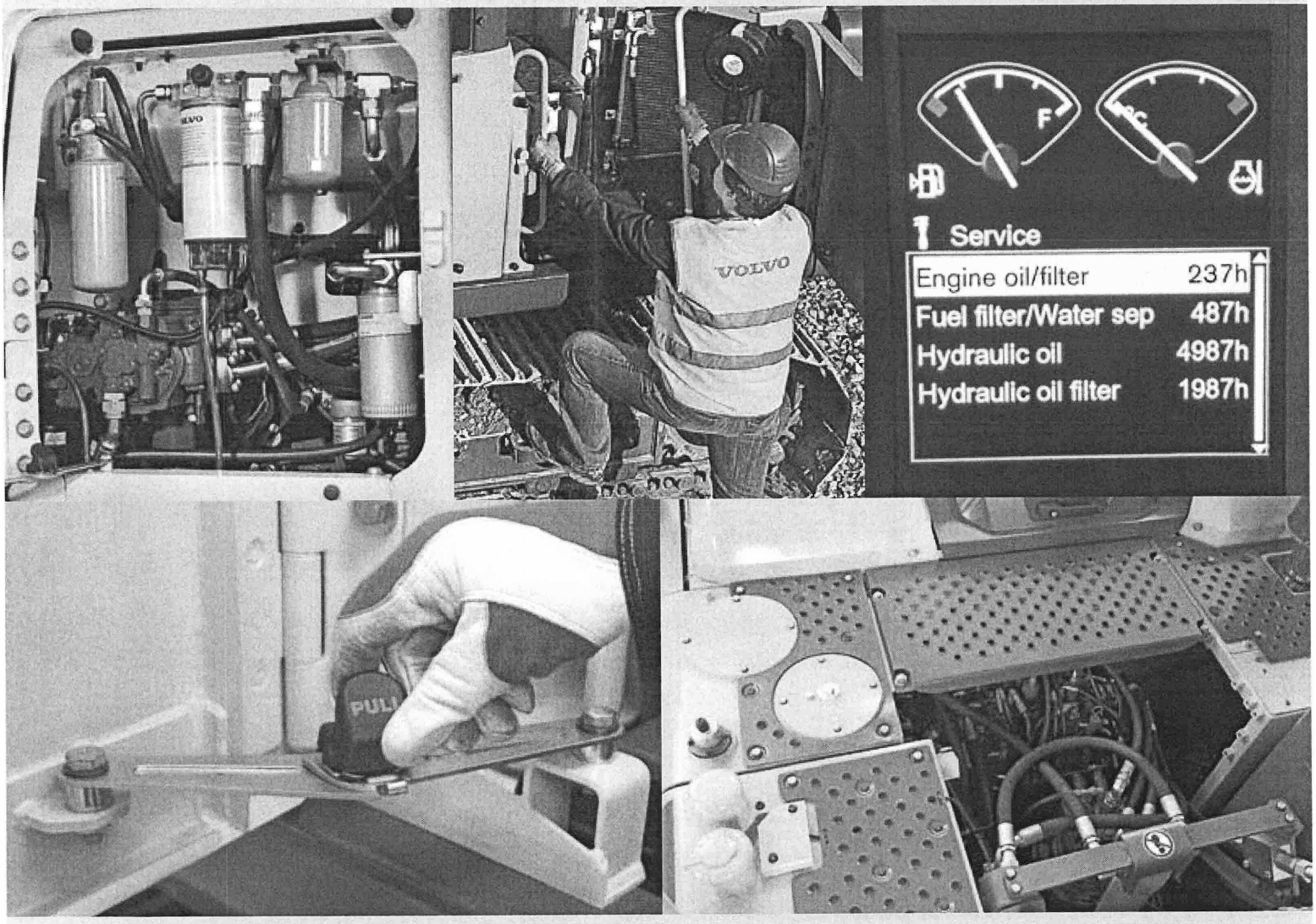
Grouped, ground level filters in the pump compartment are accessible via one door for faster servicing and more machine uptime. This reduces the need for conducting maintenance at height, increasing safety.

Rear access (EC140D, EC160D)

Rear entry behind the cab grants safe and convenient access to the main hydraulic components and engine. Newly designed stairway allows for access to the top of the superstructure.

Service intervals on I-ECU

A service mode is incorporated into the I-ECU color monitor to enable diagnostic checks. Four separate service intervals – the engine oil/filter, fuel filter/water separator, hydraulic oil and hydraulic oil filter – are displayed on the monitor.



Stays and locking devices

Volvo's automatic stays prevent doors being blown closed for added safety, they can easily be manually released. Automatic locks ensure the doors close properly and enhance appearance.

Anti-slip plates

Added operator and service mechanic safety from punched anti-slip plate which provides superb grip, especially in wet or icy conditions.

TAKE A LOOK AROUND.

Fuel efficiency

The Volvo Tier 4 Interim engine together with improved hydraulics deliver fuel efficiency and shorter cycle times for increased performance.

ECO mode

Volvo's unique, award-winning ECO mode gives more fuel efficiency without any loss of performance.

Work modes

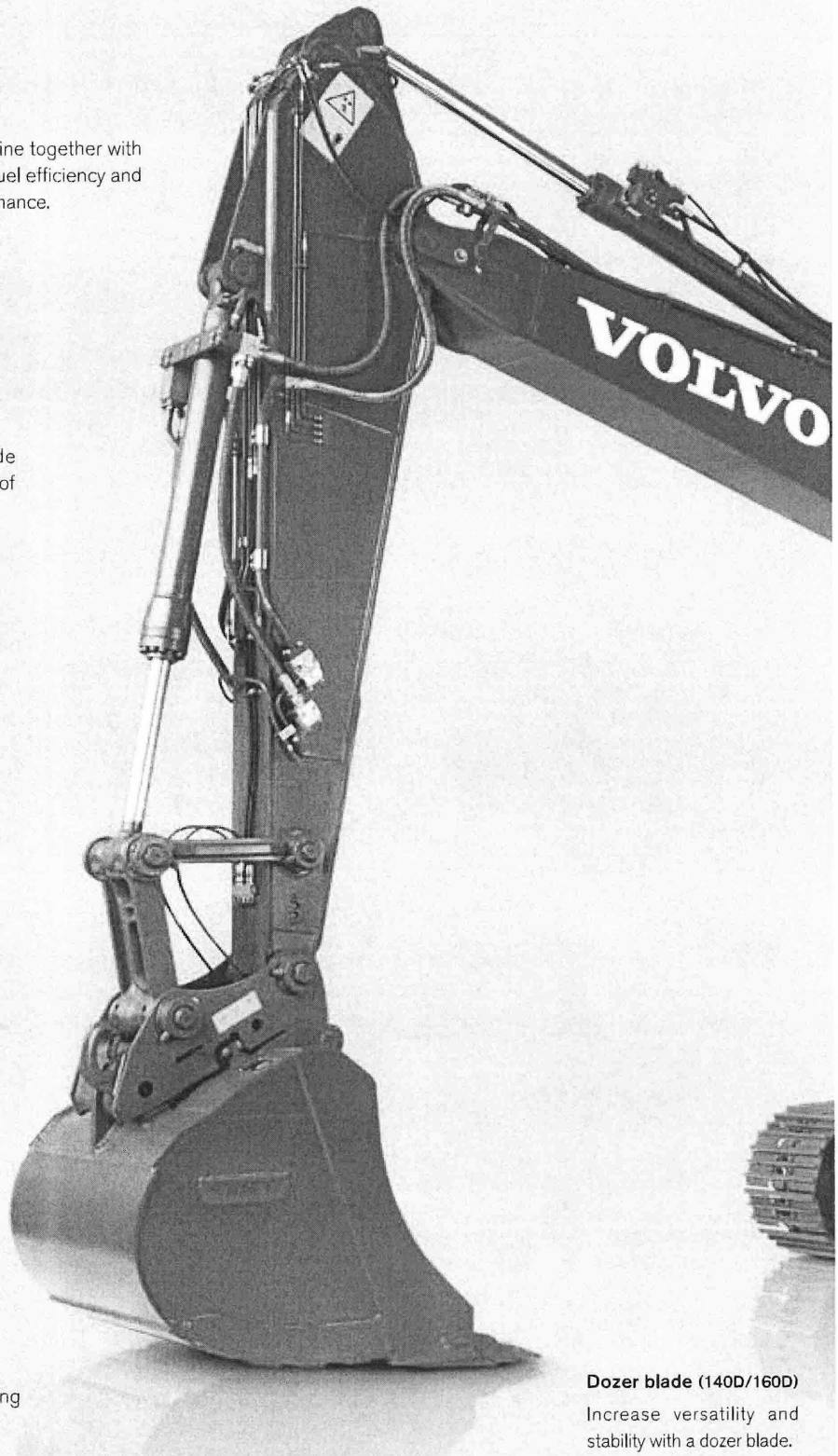
Achieve optimum performance and increased fuel efficiency by selecting the best work mode for the task at hand.

Digging power and speed

Perform at a higher level with increased digging power and faster cycle times for greater productivity.

Controllability

Smart hydraulic system for smooth and highly responsive combined operation and travel by prioritizing oil flow according to requirements.



Dozer blade (140D/160D)

Increase versatility and stability with a dozer blade.

CareTrack

Volvo's telematics system guides machine owners towards optimized productivity and their next service – remotely.

Volvo Care Cab

Enjoy all-round visibility, easy to access controls and excellent air ventilation in Volvo's spacious cab which meets ROPS safety standards.

Anti-slip plates

Added operator and service mechanic safety from punched anti-slip plate which provides superb grip, especially in wet or icy conditions.

Grouped filters

Grouped, ground level filters in the pump compartment enable faster servicing and more machine uptime.

Rear access (140D/160D)

Rear entry behind the cab grants safe and convenient access to the main hydraulic components and engine.

Powerful engine

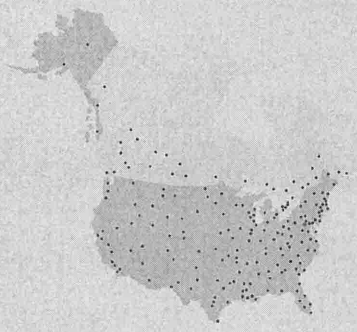
Volvo's efficient Tier 4 Interim engine gives you more power while consuming less fuel for low emission levels.

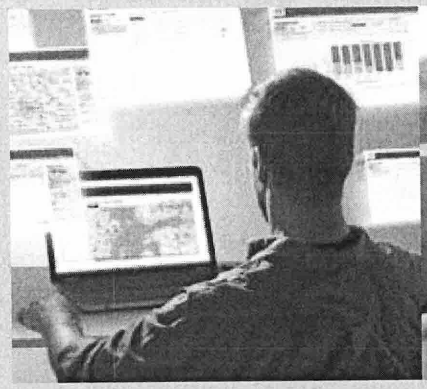
Serviceability

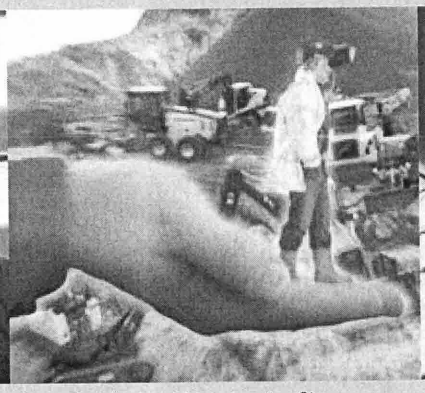
Premium serviceability from large, wide opening doors featuring automatic stays and locking devices.

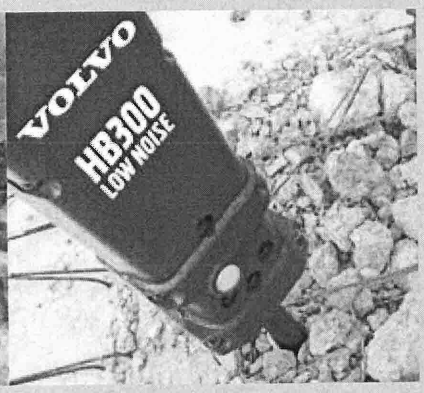
STRENGTH TO SUPPORT YOU AND YOUR BUSINESS.

The day you receive your new Volvo Excavator is just the start of your working relationship with Volvo. From service and maintenance to our CareTrack telematics system – Volvo has a comprehensive and sophisticated aftermarket portfolio to continuously add value to your business.





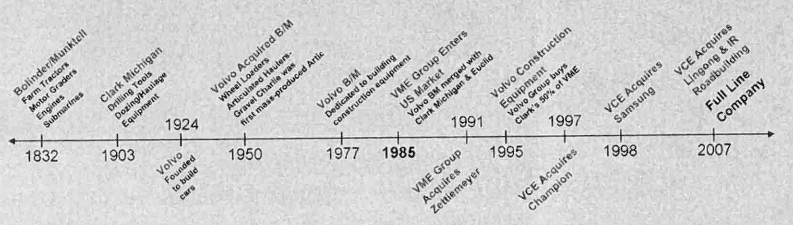




CareTrack - Volvo's telematics system works with our exclusive machine tracking info system, MATRIS, using guided diagnostics to track and analyze machines remotely - minimizing costs and maximizing uptime.

Customer Support Agreements - Gives you peace of mind by reducing total ownership costs, maximizing uptime, and distributing maintenance and major repair costs.

Attachments - Providing customers with a wide variety of attachments keep your machine working and open up new job opportunities.



Volvo designed and built your machines, so no-one knows how to keep them working in top condition more than us. When it comes to your machine, our Volvo trained technicians are the experts.

Our technicians work with industry leading diagnostic tools and techniques, using only Genuine Volvo Parts to deliver the highest levels of quality and service. Talk to your Volvo dealer about how genuine Volvo services can best provide the service and maintenance plan that is the right fit for you and your business.

State-of-the-art machines require state-of-the-art support and your Volvo dealer can provide a catalogue of services designed to get the most out of your machine, helping you maximise uptime, productivity and residual value. Your Volvo dealer can provide a number of sophisticated support offers, including:

Service plans ranging from routine wear inspections, through to comprehensive maintenance and repair agreements.

Analysis and diagnostics to help you understand how your machine is running, highlight potential maintenance issues and identify where performance can be improved.

Eco Operator training courses can help your operators work towards a safer, more productive and fuel efficient performance.

VOLVO EC140D, EC160D, EC220D IN DETAIL.

Engine

The latest generation, Volvo engine Tier 4i (Stage IIIB) emissions compliant diesel engine fully meets the demands of the latest, emissions regulations. The engine uses precise, high-pressure fuel injectors, turbo charger and air-to-air intercooler, and electronic engine controls to optimize machine performance.
Air Filter: 3-stage with pre-cleaner.
Automatic Idling System: Reduces engine speed to idle when the levers and pedals are not activated resulting in less fuel consumption and low cab noise levels.

EC140D		
Engine	Volvo	D4H
Max power at	r/s / **r/min**	33,3 / **2,000**
Net, ISO 9249/SAE J1349	kW / **hp**	84 / **113**
Gross, ISO 14396/SAE J1995	kW / **hp**	85 / **114**
Max torque at	Nm / **r/min**	535 / **1,500**
	lb. ft	395
No. of cylinders		4
Displacement	l / **cu. in**	4,036 / **246**
Bore	mm / **in**	101 / **3.98**
Stroke	mm / **in**	126 / **4.96**

EC160D		
Engine	Volvo	D4H
Max power at	r/s / **r/min**	33,3 / **2,000**
Net, ISO 9249/SAE J1349	kW / **hp**	104 / **139**
Gross, ISO 14396/SAE J1995	kW / **hp**	105 / **141**
Max torque at	Nm / **r/min**	609 / **1,600**
	lb. ft	449
No. of cylinders		4
Displacement	l / **cu. in**	4,036 / **246**
Bore	mm / **in**	101 / **3.98**
Stroke	mm / **in**	126 / **4.96**

EC220D		
Engine	Volvo	D6H
Max power at	r/s / **r/min**	30 / **1,800**
Net, ISO 9249/SAE J1349	kW / **hp**	128 / **172**
Gross, ISO 14396/SAE J1995	kW / **hp**	129 / **173**
Max torque at	Nm / **r/min**	849 / **1,350**
	lb. ft	626
No. of cylinders		6
Displacement	l / **cu. in**	5,7 / **348**
Bore	mm / **in**	98 / **3.86**
Stroke	mm / **in**	126 / **4.96**

Electrical system

High-capacity electrical system that is well protected. Waterproof double-lock harness plugs are used to secure corrosion-free connections. The main relays and solenoid valves are shielded to prevent damage. The master switch is standard. Contronics provides advanced monitoring of machine functions and important diagnostic information on the I-ECU.

		EC140D	**EC160D**	**EC220D**
Voltage	V	28		24
Batteries	V	2 x 12		2 x 12
Battery capacity	Ah	100		140
Alternator	V / Ah	28 / 110		28 / 110

Swing system

The swing system uses an axial piston motors, driving a planetary gearbox for maximum torque. An automatic holding brake and anti-rebound valve are standard.

Max. slew speed	**r/min**	**12.5**	**12.5**	**12.1**
Max. slew torque	kNm	38,8	51,7	76,7
	lbf. ft	**28,620**	**38,130**	**56,570**

Drive

Each track is powered by an automatic two-speed shift travel motor. The track brakes are multi-disc, spring-applied and hydraulic released. The travel motor, brake and planetary gears are well protected within the track frame.

Max. drawbar pull	kN	118	145	183
	lb	26,530	32,600	41,150
Max. travel speed	km/h	3,1 / 5,5	3,1 / 5,6	3,3 / 5,5
	mph	1.9 / 3.4	1.9 / 3.5	2.1 / 3.4
Gradeability	°	35	35	35

Undercarriage

The undercarriage has a robust X-shaped frame. Greased and sealed track chains are standard.

Track pads		2 x 46	2 x 44	2 x 49
Link pitch	mm	171	190	190
	in	**6.8**	**7.5**	**7.5**
Shoe width, triple grouser	mm	500 / 600 / 700 / 750 / 800 / 900		
	in	**20 / 24 / 28 / 30 / 32 / 36**		
Shoe width, triple grouser (HD)	mm	600 / 700	-	600
	in	**24 / 28**	-	**24**
Shoe width, double grouser	mm	-	-	700
	in	-	-	**28**
Shoe width, rubber shoe	mm	500	-	-
	in	**20**	-	-
Bottom rollers		2 x 7	2 x 7	2 x 8
Top rollers		2 x 1	2 x 2	2 x 2

VOLVO EC140D, EC160D, EC220D IN DETAIL.

Hydraulic system

The hydraulic system, also known as the "Automatic Sensing Work Mode" is designed for high-productivity, high-digging capacity, high-maneuvering precision and excellent fuel economy. The summation system, boom, arm, bucket and swing priority along with boom and arm regeneration provides optimum performance. The following important functions are included in the system:

Summation system: Combines the flow of both hydraulic pumps to ensure quick cycle times and high productivity.

Boom priority: Gives priority to the boom operation for faster raising when loading or performing deep excavations.

Arm priority: Gives priority to the arm operation for faster cycle times in leveling and for increased bucket filling when digging.

Swing priority: Gives priority to swing functions for faster simultaneous operations.

Hydraulic Regeneration system: Prevents cavitation and provides flow to other movements during simultaneous operations for maximum productivity.

Power boost: All digging and lifting forces are increased.

Holding valves: Boom and arm holding valves prevent the digging equipment from creeping.

		EC140D	EC160D	EC220D
Main pump, Type 2 x variable displacement axial piston pumps				
Maximum flow	l/min	2 x 124	2 x 152	2 x 207
	gpm	**2 x 33**	**2 x 40**	**2 x 55**
Pilot pump, Type Gear pump				
Maximum flow	l/min	1 x 20	1 x 20	1 x 18
	gpm	**1 x 5**	**1 x 5**	**1 x 5**

Hydraulic motors

		EC140D	EC160D	EC220D
Travel: Variable displacement axial piston motor with mechanical brake				
Slew: Fixed displacement axial piston motor with mechanical brake				
Relief valve setting				
Implement	MPa	32,4 / 34,3	34,3 / 36,3	34,3 / 36,2
	psi	**4,690 / 4,980**	**4,980 / 5,260**	**4,980 / 5,260**
Travel circuit	MPa	34,3	34,3	34,3
	psi	**4,980**	**4,980**	**4,980**
Slew circuit	MPa	24,5	26,5	27,9
	psi	**3,560**	**3,840**	**4,050**
Pilot circuit	MPa	3,9	3,9	3,9
	psi	**570**	**570**	**570**

Hydraulic cylinders

		EC140D	EC160D	EC220D
Mono boom		2	2	2
Bore x Stroke	ø x mm	105 x 980	115 x 1 165	125 x 1 235
	ø x in	**4.1 x 38.6**	**4.5 x 45.9**	**4.9 x 48.6**
2 piece boom		1	-	1
Bore x Stroke	ø x mm	160 x 765	-	160 x 1 070
	ø x in	**6.3 x 30.1**	-	**6.3 x 42.1**
Arm		1	-	1
Bore x Stroke	ø x mm	120 x 1 345	-	135 x 1 540
	ø x in	**4.7 x 53.0**	-	**5.3 x 60.6**
Bucket		1	1	1
Bore x Stroke	ø x mm	100 x 865	105 x 1 000	120 x 1 065
	ø x in	**3.9 x 34.1**	**4.1 x 39.4**	**4.7 x 41.9**
Bucket for LR boom		-	-	1
Bore x Stroke	ø x mm	-	-	100 x 865
	ø x in	-	-	**3.9 x 34.1**

Service refill capacities

		EC140D	EC160D	EC220D
Fuel tank	l	258	258	335
	gal	**68**	**68**	**89**
Hydraulic system, total	l	250	255	300
	gal	**66**	**67**	**79**
Hydraulic tank	l	91	111	150
	gal	**24**	**29**	**40**
Engine oil	l	16	16	32
	gal	**4**	**4**	**8**
Engine coolant	l	28	30	41
	gal	**7**	**8**	**11**
Slew reduction unit	l	3.9	2,6	6
	gal	**1**	**0.7**	**2**
Travel reduction unit	l	2 x 2,2	2 x 5,8	2 x 5,8
	gal	**2 x 1**	**2 x 2.0**	**2 x 2**

Cab

The operator's cab has easy access via a wide door opening.

The cab is supported on hydraulic dampening mounts to reduce shock and vibration levels. These along with sound absorbing lining provide low noise levels. The cab has excellent all-round visibility. The front windshield can easily slide up into the ceiling. and the lower front glass can be removed and stored in the side door.

Integrated air-conditioning and heating system:

The pressurized and filtered cab air is supplied by an automatically-controlled fan. The air is distributed throughout the cab from 14 vents.

Ergonomic operator's seat: The adjustable seat and joystick console move independently to accommodate the operator. The seat has nine different adjustments plus a seat belt for the operator's comfort and safety.

Sound level

		EC140D	EC160D	EC220D
Sound level in cab according to ISO 6396				
LwA - Std. / High Capacity Cooling	dB(A)	69 / 70	69 / 70	69 / 70
External sound level according to ISO 6395 and EU Noise Directive (2000/14/EC) and 474-1:2006 +A1:2009				
LwA - Std. / High Capacity Cooling	dB(A)	100 / 101	101 / 102	102 /103

SPECIFICATIONS.

MAXIMUM PERMITTED BUCKETS

EC140DL with 2 100 kg (4,630 lb) counterweight with Direct Fit

Boom, Direct Fit	4.6 m (15' 1") Mono-Boom					
Arm	2,1 m (6' 11")		2,5 m (8' 2")		3,0 m (9' 10")	
Max. bucket	liter	yd³	liter	yd³	liter	yd³
GP bucket 1,5 t/m³ (2,530 lb/yd³)	875	1.14	800	1.05	700	0.92
GP bucket 1,8 t/m³ (3,030 lb/yd³)	775	1.01	700	0.92	600	0.78
HD bucket 1,8 t/m³ (3,030 lb/yd³)	750	0.98	675	0.88	575	0.75
HD bucket 2,0 t/m³ (3,370 lb/yd³)	700	0.92	625	0.82	550	0.72

EC140DL with 2 100 kg (4,630 lb) counterweight with Quick Coupler

Boom, Quick Coupler	4.6 m (15' 1") Mono-Boom					
Arm	2,1 m (6' 11")		2,5 m (8' 2")		3,0 m (9' 10")	
Max. bucket	liter	yd³	liter	yd³	liter	yd³
GP bucket 1,5 t/m³ (2,530 lb/yd³)	800	1.05	725	0.95	600	0.78
GP bucket 1,8 t/m³ (3,030 lb/yd³)	700	0.92	625	0.82	550	0.72
HD bucket 1,8 t/m³ (3,030 lb/yd³)	675	0.88	600	0.78	500	0.65
HD bucket 2,0 t/m³ (3,370 lb/yd³)	625	0.82	550	0.72	475	0.62

EC140DL with 2 450 kg (5,400 lb) counterweight with Direct Fit

Boom, Direct Fit	4.6 m (15' 1") Mono-Boom					
Arm	2,1 m (6' 11")		2,5 m (8' 2")		3,0 m (9' 10")	
Max. bucket	liter	yd³	liter	yd³	liter	yd³
GP bucket 1,5 t/m³ (2,530 lb/yd³)	950	1.24	800	1.05	700	0.92
GP bucket 1,8 t/m³ (3,030 lb/yd³)	825	1.08	700	0.92	600	0.78
HD bucket 1,8 t/m³ (3,030 lb/yd³)	800	1.05	675	0.88	575	0.75
HD bucket 2,0 t/m³ (3,370 lb/yd³)	750	0.98	625	0.82	550	0.72

EC140DL with 2 450 kg (5,400 lb) counterweight Quick Coupler

Boom, Quick Coupler	4.6 m (15' 1") Mono-Boom					
Arm	2,1 m (6' 11")		2,5 m (8' 2")		3,0 m (9' 10")	
Max. bucket	liter	yd³	liter	yd³	liter	yd³
GP bucket 1,5 t/m³ (2,530 lb/yd³)	875	1.14	725	0.95	625	0.82
GP bucket 1,8 t/m³ (3,030 lb/yd³)	775	1.01	650	0.85	550	0.72
HD bucket 1,8 t/m³ (3,030 lb/yd³)	725	0.95	600	0.78	525	0.69
HD bucket 2,0 t/m³ (3,370 lb/yd³)	675	0.88	575	0.75	475	0.62

EC160DL with 3 200 kg (7,060 lb) counterweight with Direct Fit

Boom, Direct Fit	5,2 m (17' 1")					
Arm	2,3 m (7' 7")		2,6 m (8' 6")		3,0 m (9' 10")	
Max. bucket	liter	yd³	liter	yd³	liter	yd³
GP bucket 1,5 t/m³ (2,530 lb/yd³)	1 125	1.47	1 000	1.31	875	1.14
GP bucket 1,8 t/m³ (3,030 lb/yd³)	1 000	1.31	900	1.18	775	1.01
HD bucket 1,8 t/m³ (3,030 lb/yd³)	950	1.24	850	1.11	750	0.98
HD bucket 2,0 t/m³ (3,370 lb/yd³)	900	1.18	800	1.05	700	0.92

EC160DL with 3 200 kg (7,060 lb) counterweight with Quick Coupler

Boom, Quick Coupler	5,2 m (17' 1")					
Arm	2,3 m (7' 7")		2,6 m (8' 6")		3,0 m (9' 10")	
Max. bucket	liter	yd³	liter	yd³	liter	yd³
GP bucket 1,5 t/m³ (2,530 lb/yd³)	1 025	1.34	900	1.08	775	1.01
GP bucket 1,8 t/m³ (3,030 lb/yd³)	900	1.18	800	1.05	675	0.88
HD bucket 1,8 t/m³ (3,030 lb/yd³)	850	1.11	750	0.98	650	0.85
HD bucket 2,0 t/m³ (3,370 lb/yd³)	800	1.05	700	0.92	600	0.78

EC220DL with 4 200 kg (9,260 lb) counterweight with Direct Fit

Boom, Direct Fit	5,7 m (18'8")					
Arm	2,5 m (8'2")		2,9 m (9'6")		3,5 m (11'6")	
Max. bucket	liter	yd³	liter	yd³	liter	yd³
GP bucket 1,5 t/m³ (2,530 lb/yd³)	1 500	1.96	1 350	1.77	1 200	1.57
GP bucket 1,8 t/m³ (3,030 lb/yd³)	1 325	1.73	1 200	1.57	1 075	1.41
HD bucket 1,8 t/m³ (3,030 lb/yd³)	1 250	1.64	1 125	1.47	1 000	1.31
HD bucket 2,0 t/m³ (3,370 lb/yd³)	1 175	1.54	1 050	1.37	950	1.24

EC220DL with 4 200 kg (9,260 lb) counterweight with Quick Coupler

Boom, Quick Coupler	5,7 m (18'8")					
Arm	2,5 m (8'2")		2,9 m (9'6")		3,5 m (11'6")	
Max. bucket	liter	yd³	liter	yd³	liter	yd³
GP bucket 1,5 t/m³ (2,530 lb/yd³)	1 350	1.77	1 225	1.60	1 075	1.41
GP bucket 1,8 t/m³ (3,030 lb/yd³)	1 200	1.57	1 075	1.41	950	1.24
HD bucket 1,8 t/m³ (3,030 lb/yd³)	1 150	1.50	1 025	1.34	900	1.18
HD bucket 2,0 t/m³ (3,370 lb/yd³)	1 075	1.41	950	1.24	825	1.08

Note: 1. Bucket size based on ISO 7451, heaped material with a 1:1 angle of repose.
2. "Max permitted sizes" are for reference only and are not necessarily available from the factory.
3. Bucket widths are less than bucket's tip radius.

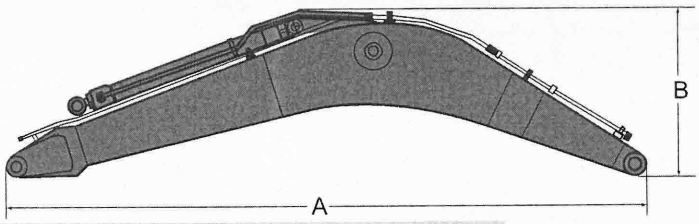
SPECIFICATIONS.

MACHINE WEIGHTS AND GROUND PRESSURE

Description	Shoe width		Operating weight		Ground pressure		Overall width		Operating weight		Ground pressure		Overall width	
Units	mm	in	kg	lb	kPa	psi	mm	in	kg	lb	kPa	psi	mm	in
EC140DL			4,6 m (15' 1") boom, 2,5 m (8' 2") arm, 390 kg (860 lb) bucket, 2 100 kg (4,630 lb) counterweight						4,6 m (15' 1") 2 piece boom, 2,5 m (8' 2") arm, 390 kg (860 lb) bucket, 2 100 kg (4,630 lb) counterweight					
Triple grouser	500	20	13 160	29,020	41,2	6.0	2 490	8' 2"	13 510	29,790	42,2	6.1	2 490	8' 2"
	600	24	13 360	29,460	35,3	5.1	2 590	8' 6"	13 710	30,230	36,3	5.3	2 590	8' 6"
	750	30	13 750	30,320	28,4	4.1	2 740	9' 0"	14 100	31,090	29,4	4.3	2 740	9' 0"
Triple grouser HD	600	24	13 430	29,610	35,3	5.1	2 590	8' 6"	13 780	30,380	36,3	5.3	2 590	8' 6"
	700	28	13 630	30,050	30,4	4.4	2 690	8' 10"	13 980	30,830	31,4	4.6	2 690	8' 10"
Rubber grouser	500	20	13 200	29,110	41,2	6.0	2 490	8' 2"	13 540	29,860	42,2	6.1	2 490	8' 2"
EC140DL with Dozer Blade			4,6 m (15' 1") boom, 2,5 m (8' 2") arm, 390 kg (860 lb) bucket, 2 100 kg (4,630 lb) counterweight						4,6 m (15' 1") 2 piece boom, 2,5 m (8' 2") arm, 390 kg (860 lb) bucket, 2 100 kg (4,630 lb) counterweight					
Triple grouser	500	20	14 100	31,090	44,1	6.4	2 490	8' 2"	14 440	31,840	45,1	6.5	2 490	8' 2"
	600	24	14 290	31,510	37,3	5.4	2 590	8' 6"	14 640	32,280	38,2	5.5	2 590	8' 6"
	750	30	14 690	32,390	30,4	4.4	2 740	9' 0"	15 030	33,140	31,4	4.6	2 740	9' 0"
Triple grouser HD	600	24	14 370	31,690	37,3	5.4	2 590	8' 6"	14 710	32,440	38,2	5.5	2 590	8' 6"
	700	28	14 570	32,130	32,4	4.7	2 690	8' 10"	14 910	32,880	33,3	4.8	2 690	8' 10"
Rubber grouser	500	20	14 130	31,160	44,1	6.4	2 490	8' 2"	14 480	31,930	45,1	6.5	2 490	8' 2"
EC140DL			4,6 m (15' 1") boom, 2,5 m (8' 2") arm, 390 kg (860 lb) bucket, 2 450 kg (5,400 lb) counterweight						4,6 m (15' 1") 2 piece boom 2,5 m (8' 2") arm, 390 kg (860 lb) bucket, 2 450 kg (5,400 lb) counterweight					
Triple grouser	500	20	13 510	29,790	42,2	6.1	2 490	8' 2"	13 860	30,560	43,1	6.3	2 490	8' 2"
	600	24	13 710	30,230	36,3	5.3	2 590	8' 6"	14 060	31,000	37,3	5.4	2 590	8' 6"
	750	30	14 100	31,090	29,4	4.3	2 740	9' 0"	14 450	31,860	30,4	4.4	2 740	9' 0"
Triple grouser HD	600	24	13 780	30,380	36,3	5.3	2 590	8' 6"	14 130	31,160	37,3	5.4	2 590	8' 6"
	700	28	13 980	30,830	31,4	4.6	2 690	8' 10"	14 330	31,600	32,4	4.7	2 690	8' 10"
Rubber grouser	500	20	13 550	29,880	42,2	6.1	2 490	8' 2"	13 890	30,630	43,1	6.3	2 490	8' 2"
EC140DL with Dozer Blade			4,6 m (15' 1") boom, 2,5 m (8' 2") arm, 390 kg (860 lb) bucket, 2 450 kg (5,400 lb) counterweight						4,6 m (15' 1") 2 piece boom, 2,5 m (8' 2") arm, 390 kg (860 lb) bucket, 2 450 kg (5,400 lb) counterweight					
Triple grouser	500	20	14 450	31,860	45,1	6.5	2 490	8' 2"	14 790	32,610	46,1	6.7	2 490	8' 2"
	600	24	14 640	32,280	38,2	5.5	2 590	8' 6"	14 990	33,050	39,2	5.7	2 590	8' 6"
	750	30	15 040	33,160	31,4	4.6	2 740	9' 0"	15 380	33,910	32,4	4.7	2 740	9' 0"
Triple grouser HD	600	24	14 720	32,460	38,2	5.5	2 590	8' 6"	15 060	33,210	39,2	5.7	2 590	8' 6"
	700	28	14 920	32,900	33,3	4.8	2 690	8' 10"	15 260	33,650	34,3	5.0	2 690	8' 10"
Rubber grouser	500	20	14 480	31,930	45,1	6.5	2 490	8' 2"	14 830	32,700	46,1	6.7	2 490	8' 2"
EC160DL			5,2 m (17' 1") boom, 2,6 m (8' 6") arm, 470 kg (1,040 lb) bucket, 3 200 kg (7,060 lb) counterweight											
Triple grouser	500	20	17 150	37,820	49,0	7.1	2 490	8' 2"						
	600	24	17 380	38,320	41,2	6.0	2 590	8' 6"						
	700	28	17 620	38,850	35,3	5.1	2 690	8' 10"						
	800	32	18 010	39,710	31,4	4.6	2 790	9' 2"						
	900	36	18 280	40,310	28,4	4.1	2 990	9' 10"						
EC160DL with Dozer Blade			5,2 m (17' 1") boom, 2,6 m (8' 6") arm, 470 kg (1,040 lb) bucket, 3 200 kg (7,060 lb) counterweight											
Triple grouser	500	20	18 310	40,370	52,0	7.5	2 490	8' 2"						
	600	24	18 540	40,880	44,1	6.4	2 590	8' 6"						
	700	28	18 780	41,410	38,2	5.5	2 690	8' 10"						
	800	32	19 170	42,270	34,3	5.0	2 790	9' 2"						
	900	36	19 440	42,870	30,4	4.4	2 990	9' 10"						
EC220DL			5,7 m (18' 8") boom, 2,9 m (9' 6") arm, 776 kg (1,710 lb) bucket, 4 200 kg (9,260 lb) counterweight						5,57 m (18' 3") 2 piece boom, 2,9 m (9' 6") arm, 776 kg (1,710 lb) bucket, 4 200 kg (9,260 lb) counterweight					
Triple grouser	500	20	21 870	48,220	54,9	8.0	2 890	9' 6"	22 560	49,740	55,9	8.1	2 890	9' 6"
	600	24	22 130	48,800	46,1	6.7	2 990	9' 10"	22 810	50,300	47,1	6.8	2 990	9' 10"
	700	28	22 580	49,790	40,2	5.8	3 090	10' 2"	23 260	51,290	41,2	6.0	3 090	10' 2"
	800	32	22 860	50,410	35,3	5.1	3 190	10' 6"	23 550	51,930	36,3	5.3	3 190	10' 6"
	900	36	23 150	51,050	32,4	4.7	3 290	10' 10"	23 830	52,550	33,3	4.8	3 290	10' 10"
Triple grouser HD	600	24	22 300	49,170	46,1	6.7	2 990	9' 10"	22 980	50,670	48,0	7.0	2 990	9' 10"
Double grouser	700	28	22 860	50,410	40,2	5.8	3 090	10' 2"	23 550	51,930	42,2	6.1	3 090	10' 2"
EC220DLR			8,85 m (29' 0") boom, 6,25 m (20' 6") arm, 452 kg (1,000 lb) bucket, 5 000 kg (11,025 lb) counterweight											
Triple grouser	800	32	23 860	52,610	37,3	5.4	3 190	10' 6"						
	900	36	24 140	53,230	33,3	4.8	3 290	10' 10"						

DIMENSIONS

Boom

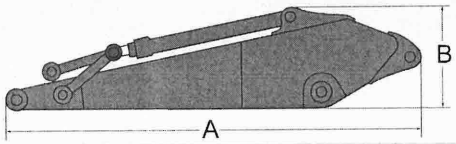


		EC140D	
Description	Unit	mono	2-piece
Boom	m (in)	4,6 (15' 1")	4,6 (15' 1")
Length (A)	mm (in)	4 770 (15' 8")	4 765 (15' 8")
Height (B)	mm (in)	1 370 (4' 6")	1 225 (4' 0")
Width	mm (in)	545 (1' 9")	545 (1' 9")
Weight	kg (lb)	1 100 (2,430)	1 400 (3,090)

	EC160D
Description	Unit
Boom	m (in)	5,2 (17'1")
Length (A)	mm (in)	5 400 (17' 9")
Height (B)	mm (in)	1 640 (5' 5")
Width	mm (in)	565 (1' 10")
Weight	kg (lb)	1 370 (3,020)

		EC220D			
Description	Unit	mono	mono	2-piece	Long reach
Boom	m (in)	5,7 GP (18' 8")	5,7 HD (18' 8")	5,57 (18' 3")	8,85 (29' 0")
Length (A)	mm (in)	5 910 (19' 5")	5 910 (19' 5")	5 780 (19' 0")	9 060 (29' 9")
Height (B)	mm (in)	1 585 (5' 2")	1 585 (5' 2")	1 570 (5' 2")	1 460 (4' 9")
Width	mm (in)	670 (2' 2")	670 (2' 2")	670 (2' 2")	670 (2' 2")
Weight	kg (lb)	1 995 (4,400)	2 135 (4,710)	2 585 (5,700)	2 510 (5,530)

Arm



		EC140D		
Description	Unit			
Arm	m (in)	2,1 (6' 11")	2,5 (8' 2")	3,0 (9' 10")
Length (A)	mm (in)	2 800 (9' 2")	3 200 (10' 6")	2 700 (8' 10")
Height (B)	mm (in)	710 (2' 4")	710 (2' 4")	780 (2' 7")
Width	mm (in)	300 (1' 0")	300 (1' 0")	300 (1' 0")
Weight	kg (lb)	555 (1,220)	625 (1,380)	685 (1,510)

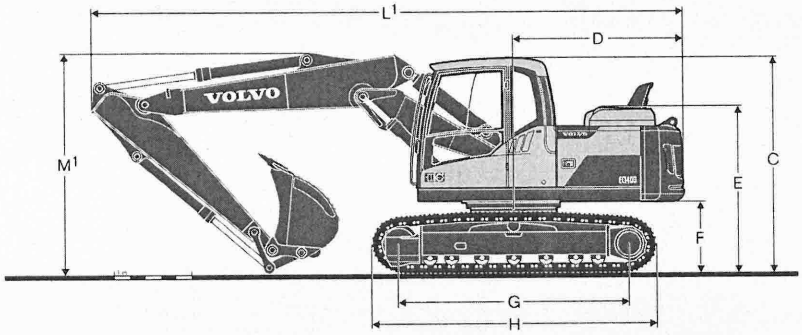
		EC160D		
Description	Unit			
Arm	m (in)	2,3 (7' 7")	2,6 (8' 6")	3,0 (9' 10")
Length (A)	mm (in)	3 240 (10' 8")	3 500 (11' 6")	3 900 (12' 10")
Height (B)	mm (in)	855 (2' 10")	855 (2' 10")	845 (2' 9")
Width	mm (in)	395 (1' 4")	395 (1' 4")	395 (1' 4")
Weight	kg (lb)	790 (1,740)	800 (1,760)	860 (1,900)

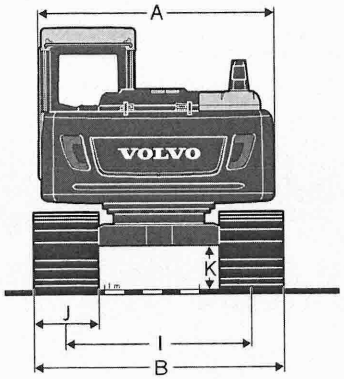
		EC220D				
Description	Unit					
Arm	m (in)	2,5 HD (8' 2")	2,9 GP (9' 6")	2,9 HD (9' 6")	3,5 GP (11' 6")	6,25 LR (20' 6")
Length (A)	mm (in)	3 525 (11' 7")	3 910 (12' 10")	3 910 (12' 10")	4 540 (14' 11")	7 330 (24' 1")
Height (B)	mm (in)	860 (2' 10")	860 (2' 10")	860 (2' 10")	855 (2' 10")	945 (3' 1")
Width	mm (in)	440 (1' 5")	440 (1' 5")	440 (1' 5")	440 (1' 5")	385 (1' 3")
Weight	kg (lb)	1 126 (2,480)	1 121 (2,470)	1 176 (2,590)	1 226 (2,700)	1 309 (2,890)

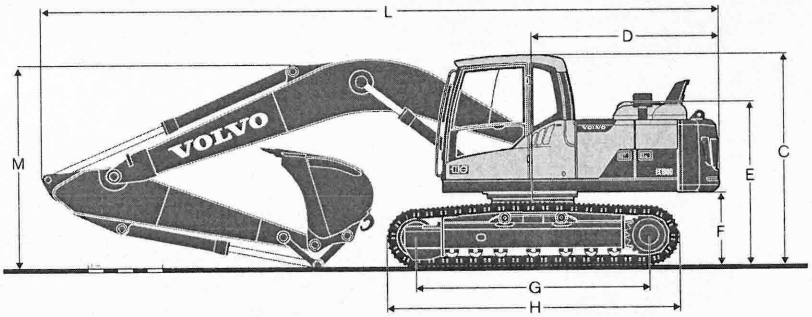
Boom: Includes cylinder, piping and pin, excludes boom cyl. Pin. Arm: Includes cylinder, linkage and pin.

SPECIFICATIONS.

DIMENSIONS - EC140DL and EC160DL



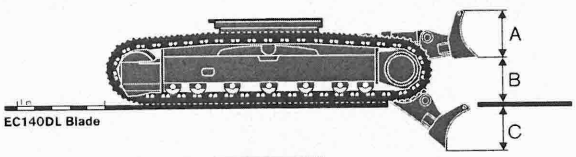




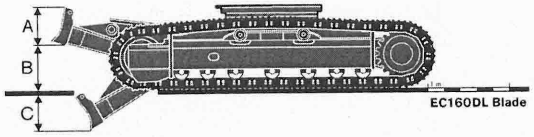
Description	Unit	EC140DL			EC160DL		
Boom	m, (ft-in)	4,6 (15' 1") mono or 4,6 (15' 1") 2-piece			5,2 (17' 1")		
Arm	m, (ft-in)	2,1 (6' 11")	2,5 (8' 2")	3,0 (9' 10")	2,3 (7' 7")	2,6 (8' 6")	3,0 (9' 10")
A. Overall width of upper structure	mm, (ft-in)	2 490 (8' 2")	2 490 (8' 2")	2 490 (8' 2")	2 490 (8' 2")	2 490 (8' 2")	2 490 (8' 2")
B. Overall width	mm, (ft-in)	2 590 (8' 6")	2 590 (8' 6")	2 590 (8' 6")	2 590 (8' 6")	2 590 (8' 6")	2 590 (8' 6")
C. Overall height of cab	mm, (ft-in)	2 800 (9' 2")	2 800 (9' 2")	2 800 (9' 2")	2 900 (9' 6")	2 900 (9' 6")	2 900 (9' 6")
D. Tail slew radius	mm, (ft-in)	2 200 (7' 3")	2 200 (7' 3")	2 200 (7' 3")	2 550 (8' 4")	2 550 (8' 4")	2 550 (8' 4")
E. Overall height of engine hood	mm, (ft-in)	2 020 (6' 8")	2 020 (6' 8")	2 020 (6' 8")	2 235 (7' 4")	2 235 (7' 4")	2 235 (7' 4")
F. Counterweight clearance *	mm, (ft-in)	920 (3' 0")	920 (3' 0")	920 (3' 0")	1 010 (3' 4")	1 010 (3' 4")	1 010 (3' 4")
G. Tumbler length	mm, (ft-in)	3 040 (10' 0")	3 040 (10' 0")	3 040 (10' 0")	3 180 (10' 5")	3 180 (10' 5")	3 180 (10' 5")
H. Track length	mm, (ft-in)	3 760 (12' 4")	3 760 (12' 4")	3 760 (12' 4")	3 980 (13' 1")	3 980 (13' 1")	3 980 (13' 1")
I. Track gauge	mm, (ft-in)	1 990 (6' 6")	1 990 (6' 6")	1 990 (6' 6")	1 990 (6' 6")	1 990 (6' 6")	1 990 (6' 6")
J. Shoe width	mm, (in)	600 (24")	600 (24")	600 (24")	600 (24")	600 (24")	600 (24")
K. Min. ground clearance *	mm, (ft-in)	436 (1' 5")	436 (1' 5")	436 (1' 5")	460 (1' 6")	460 (1' 6")	460 (1' 6")
L. Overall length	mm, (ft-in)	7 630 (25' 0")	7 630 (25' 0")	7 630 (25' 0")	8 880 (29' 2")	8 990 (28' 9")	8 810 (28' 11")
L1. Overall length	mm, (ft-in)	7 610 (25' 0")	7 550 (24' 9")	7 320 (24' 0")	-	-	-
M. Overall height of boom	mm, (ft-in)	2 710 (8' 11")	2 830 (9' 3")	3 210 (10' 6")	2 980 (9' 9")	2 900 (9' 6")	3 020 (9' 11")
M1. Overall height of boom	mm, (ft-in)	2 720 (8' 11")	2 950 (9' 8")	3 350 (11' 0")	-	-	-

* Without shoe grouser / 1 2-piece boom

Front dozer blade	Unit	EC140DL	EC160DL
A. Height	m, (ft-in)	585 (1' 11")	452 (1' 6")
Width	mm, (ft-in)	2 590 (8' 6")	2 800 (9' 2")
Weight	kg, (lb)	458 (1,010)	595 (1,310)
B. Lift height	mm, (ft-in)	478 (1' 7")	571 (1' 10")
C. Digging depth	mm, (ft-in)	601 (2' 0")	735 (2' 5")

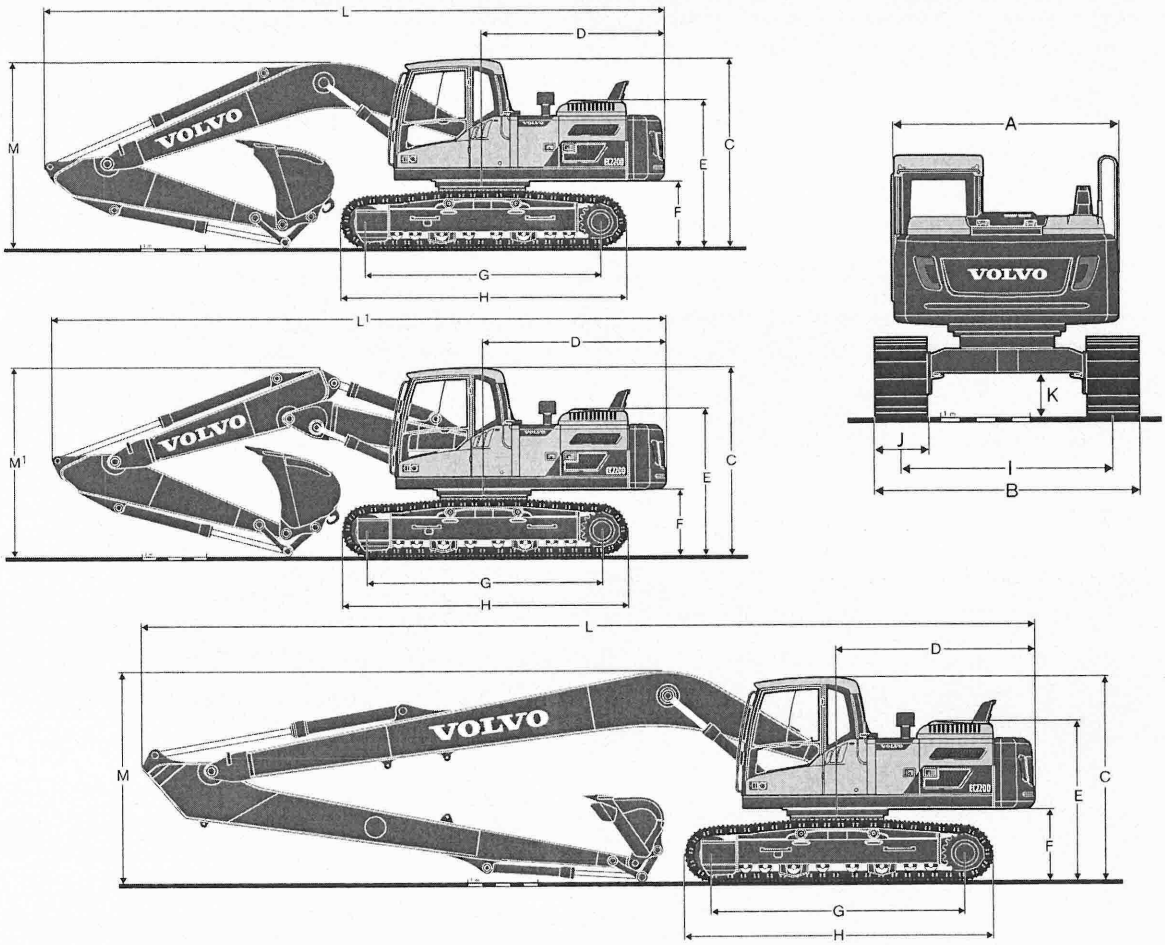


EC140DL Blade



EC160DL Blade

DIMENSIONS - EC220DL and EC220DLR

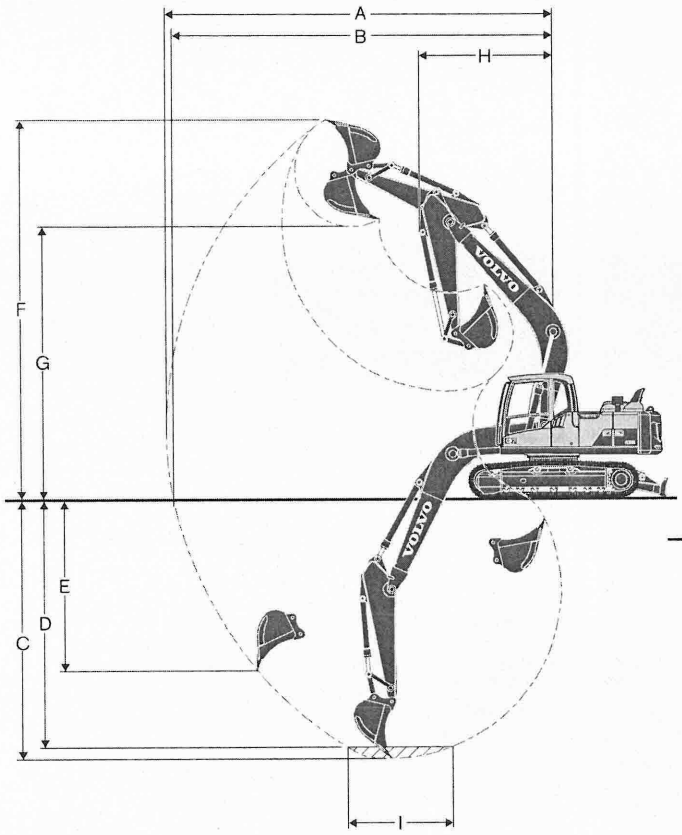


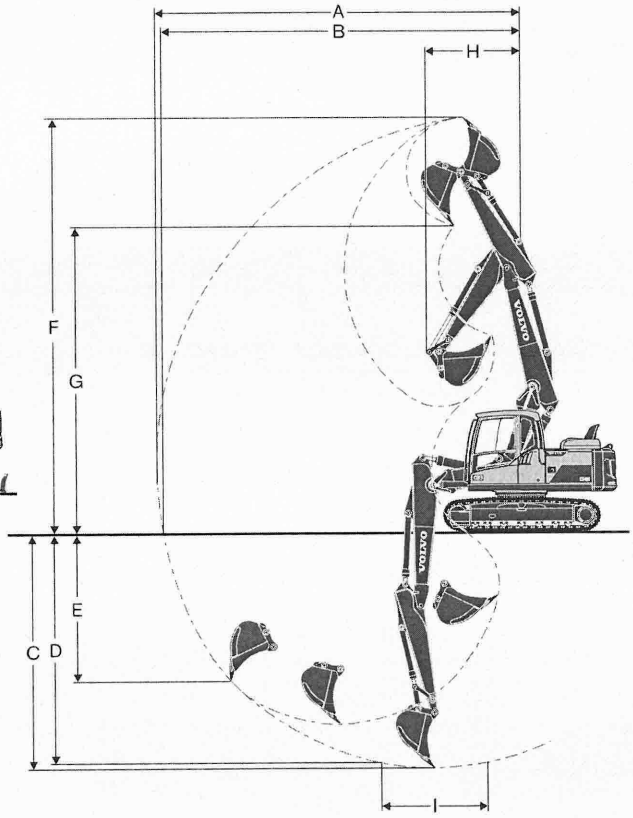
Description	Unit	EC220DL			EC220DLR
Boom	m, (ft-in)	5,7 (18' 8") mono or 5,57 (18' 3") 2-piece			8,85 (29' 0")
Arm	m, (ft-in)	2,5 (8' 2")	2,9 (9' 6")	3,5 (11' 6")	6,25 (20' 6")
A. Overall width of upper structure	mm, (ft-in)	2 540 (8' 4")	2 540 (8' 4")	2 540 (8' 4")	2 540 (8' 4")
B. Overall width	mm, (ft-in)	2 990 (9' 10")	2 990 (9' 10")	2 990 (9' 10")	3 190 (10' 6")
C. Overall height of cab	mm, (ft-in)	2 930 (9' 7")	2 930 (9' 7")	2 930 (9' 7")	2 930 (9' 7")
D. Tail slew radius	mm, (ft-in)	2 850 (9' 4")	2 850 (9' 4")	2 850 (9' 4")	2 850 (9' 4")
E. Overall height of engine hood	mm, (ft-in)	2 305 (7' 7")	2 305 (7' 7")	2 305 (7' 7")	2 305 (7' 7")
F. Counterweight clearance *	mm, (ft-in)	1 025 (3' 4")	1 025 (3' 4")	1 025 (3' 4")	1 025 (3' 4")
G. Tumbler length	mm, (ft-in)	3 660 (12' 0")	3 660 (12' 0")	3 660 (12' 0")	3 660 (12' 0")
H. Track length	mm, (ft-in)	4 460 (14' 8")	4 460 (14' 8")	4 460 (14' 8")	4 460 (14' 8")
I. Track gauge	mm, (ft-in)	2 390 (7' 10")	2 390 (7' 10")	2 390 (7' 10")	2 390 (7' 10")
J. Shoe width	mm, (in)	600 (24")	600 (24")	600 (24")	800 (32")
K. Min. ground clearance *	mm, (ft-in)	460 (1' 6")	460 (1' 6")	460 (1' 6")	460 (1' 6")
L. Overall length	mm, (ft-in)	9 745 (32' 0")	9 690 (31' 9")	9 720 (31' 11")	12 880 (42' 3")
L¹. Overall length	mm, (ft-in)	9 610 (31' 6")	9 570 (31' 5")	9 560 (31' 4")	-
M. Overall height of boom	mm, (ft-in)	3 080 (10' 1")	2 940 (9' 8")	3 260 (10' 8")	3 055 (10' 0")
M¹. Overall height of boom	mm, (ft-in)	3 065 (10' 1")	2 960 (9' 9")	3 310 (10' 10")	-

* Without shoe grouser / ¹ 2-piece boom

SPECIFICATIONS.

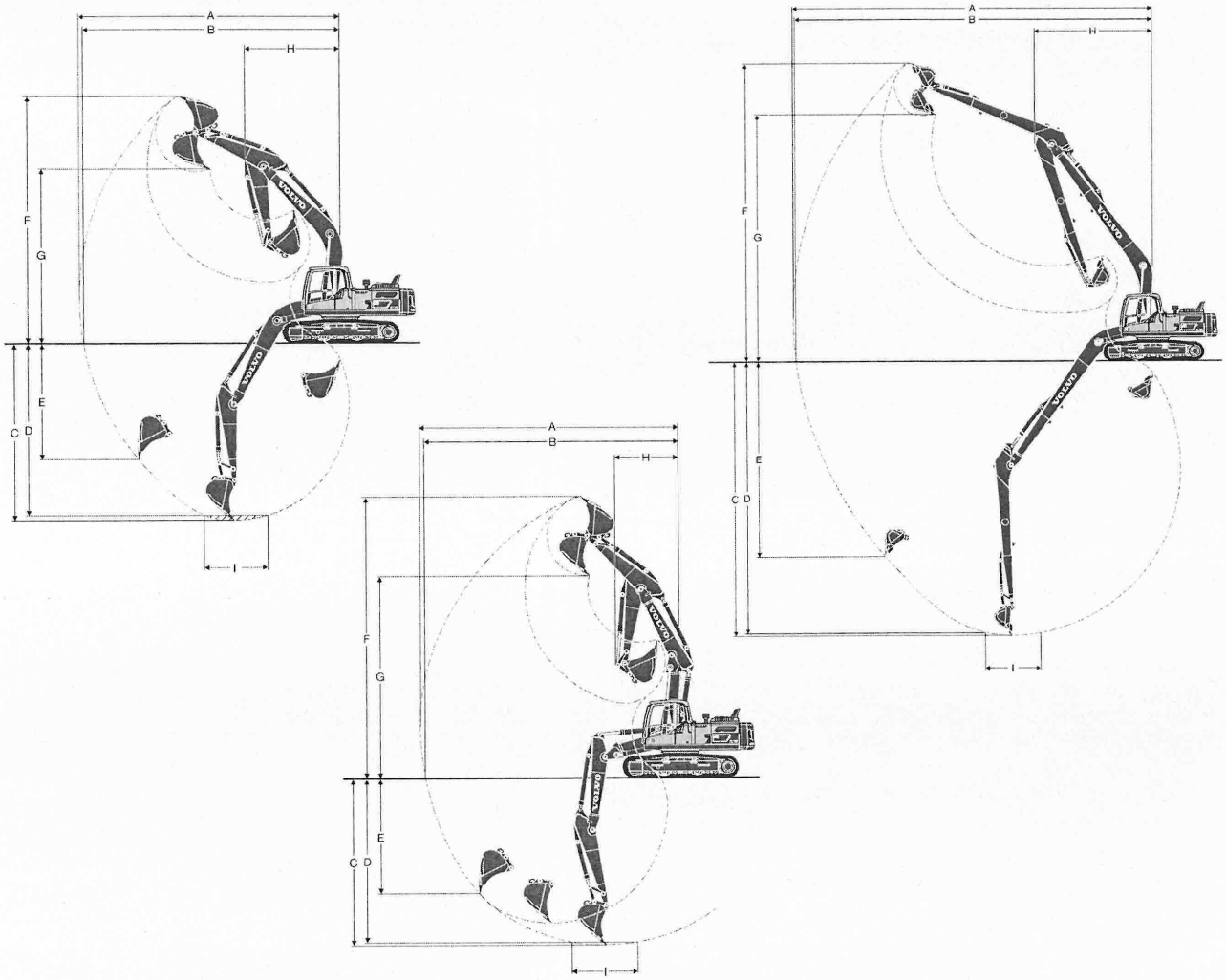
WORKING RANGES





Description		Unit	EC140DL						EC160DL		
Boom		m, (ft-in)	4,6 (15' 1") mono			4,6 (15' 1") 2-piece			5,2 (17' 1") mono		
Arm		m, (ft-in)	2,1 (6' 11")	2,5 (8' 2")	3,0 (9' 10")	2,1 (6' 11")	2,5 (8' 2")	3,0 (9' 10")	2,3 (7' 7")	2,6 (8' 6")	3,0 (9' 10")
A. Max. digging reach		mm, (ft-in)	7 960 (26' 1")	8 330 (27' 4")	8 820 (28' 11")	8 050 (26' 5")	8 440 (27' 8")	8 930 (29' 4")	8 650 (28' 5")	8 970 (29' 5")	9 340 (30' 8")
B. Max. digging reach on ground		mm, (ft-in)	7 810 (25' 7")	8 190 (26' 10")	8 690 (28' 6")	7 910 (25' 11")	8 300 (27' 3")	8 800 (28' 10")	8 490 (27' 10")	8 810 (28' 11")	9 180 (30' 1")
C. Max. digging depth		mm, (ft-in)	5 130 (16' 10")	5 530 (18' 2")	6 030 (19' 9")	5 060 (16' 7")	5 450 (17' 11")	5 950 (19' 6")	5 740 (18' 10")	6 040 (19' 10")	6 440 (21' 2")
D. Max. digging depth (l = 2,440 m, (8') level)		mm, (ft-in)	4 880 (16' 0")	5 310 (17' 5")	5 850 (19' 2")	4 930 (16' 2")	5 340 (17' 6")	5 850 (19' 2")	5 420 (17' 9")	5 770 (18' 11")	6 200 (20' 4")
E. Max. vertical wall digging depth		mm, (ft-in)	4 580 (15' 0")	4 970 (16' 4")	5 510 (18' 1")	4 290 (14' 1")	4 680 (15' 4")	5 180 (17' 0")	4 480 (14' 8")	4 950 (16' 3")	5 380 (17' 8")
F. Max. cutting height		mm, (ft-in)	8 190 (26' 10")	8 420 (27' 7")	8 770 (28' 9")	9 260 (30' 5")	9 620 (31' 7")	10 090 (33' 1")	8 570 (28' 1")	8 820 (28' 11")	9 030 (29' 8")
G. Max. dumping height		mm, (ft-in)	5 770 (18' 11")	6 010 (19' 9")	6 350 (20' 10")	6 800 (22' 4")	7 160 (23' 6")	7 640 (25' 1")	6 110 (20' 1")	6 340 (20' 10")	6 540 (21' 5")
H. Min. front slew radius		mm, (ft-in)	2 540 (8' 4")	2 600 (8' 6")	2 830 (9' 3")	1 930 (6' 4")	2 190 (7' 2")	2 620 (8' 7")	3 070 (10' 1")	3 070 (10' 1")	3 070 (10' 1")
Digging forces with direct fit bucket											
Bucket radius		mm, (in)	1 250 (49")	1 250 (49")	1 250 (49")	1 250 (49")	1 250 (49")	1 250 (49")	1 315 (52")	1 315 (52")	1 315 (52")
Breakout force - bucket											
Normal	SAE J1179	kN, (lb)	82,4 (18,560)	82,4 (18,560)	82,4 (18,560)	82,4 (18,560)	82,4 (18,560)	82,4 (18,560)	101,9 (22,900)	101,9 (22,900)	101,9 (22,900)
Power boost	SAE J1179	kN, (lb)	87,3 (19,620)	87,3 (19,620)	87,3 (19,620)	87,3 (19,620)	87,3 (19,620)	87,3 (19,620)	107,7 (24,210)	107,7 (24,210)	107,7 (24,210)
Normal	ISO 6015	kN, (lb)	93,2 (20,950)	93,2 (20,950)	93,2 (20,950)	93,2 (20,950)	93,2 (20,950)	93,2 (20,950)	114,7 (25,780)	114,7 (25,780)	114,7 (25,780)
Power boost	ISO 6015	kN, (lb)	98,1 (22,050)	98,1 (22,050)	98,1 (22,050)	98,1 (22,050)	98,1 (22,050)	98,1 (22,050)	121,3 (27,260)	121,3 (27,260)	121,3 (27,260)
Tearout force - dipper arm											
Normal	SAE J1179	kN, (lb)	69,6 (15,660)	61,8 (13,890)	54,9 (12,350)	69,6 (15,660)	61,8 (13,890)	54,9 (12,350)	90,4 (20,320)	80,4 (18,070)	72,8 (16,360)
Power boost	SAE J1179	kN, (lb)	73,5 (16,540)	65,7 (14,770)	58,8 (13,230)	73,5 (16,540)	65,7 (14,770)	58,8 (13,230)	95,5 (21,470)	85 (19,110)	76,9 (17,280)
Normal	ISO 6015	kN, (lb)	71,6 (16,100)	63,7 (14,330)	56,9 (12,790)	71,6 (16,100)	63,7 (14,330)	56,9 (12,790)	92,9 (20,880)	82,3 (18,500)	74,3 (16,700)
Power boost	ISO 6015	kN, (lb)	75,5 (16,980)	67,7 (15,210)	59,8 (13,450)	75,5 (16,980)	67,7 (15,210)	59,8 (13,450)	98,2 (22,070)	87 (19,560)	78,6 (17,670)
Rotation angle, bucket		°	174	174	174	174	174	174	183	183	183

WORKING RANGES



Description		Unit	EC220DL						EC220DLR
Boom		m, (ft-in)	5,7 (18' 8") mono			5,57 (18' 3") 2-piece			8,85 (29' 0")
Arm		m, (ft-in)	2,5 (8' 2")	2,9 (9' 6")	3,5 (11' 6")	2,5 (8' 2")	2,9 (9' 6")	3,5 (11' 6")	6,25 (20' 6")
A. Max. digging reach		mm, (ft-in)	9 550 (31' 4")	9 930 (32' 7")	10 390 (34' 1")	9 450 (31' 0")	9 840 (32' 3")	10 310 (33' 10")	15 800 (51' 10")
B. Max. digging reach on ground		mm, (ft-in)	9 380 (30' 9")	9 770 (32' 1")	10 240 (33' 7")	9 280 (30' 5")	9 670 (31' 9")	10 150 (33' 4")	15 700 (51' 6")
C. Max. digging depth		mm, (ft-in)	6 330 (20' 9")	6 730 (22' 1")	7 330 (24' 1")	5 900 (19' 4")	6 300 (20' 8")	6 850 (22' 6")	12 100 (39' 8")
D. Max. digging depth (I = 2,440 m, (8') level)		mm, (ft-in)	6 100 (20' 0")	6 540 (21' 5")	7 130 (23' 5")	5 790 (19' 0")	6 200 (20' 4")	6 750 (22' 2")	12 000 (39' 4")
E. Max. vertical wall digging depth		mm, (ft-in)	5 620 (18' 5")	6 090 (20' 0")	6 470 (21' 3")	4 990 (16' 4")	5 410 (17' 9")	5 930 (19' 5")	11 290 (37' 0")
F. Max. cutting height		mm, (ft-in)	9 220 (30' 3")	9 460 (31' 0")	9 460 (31' 0")	10 380 (34' 1")	10 710 (35' 2")	10 920 (35' 10")	13 300 (43' 8")
G. Max. dumping height		mm, (ft-in)	6 430 (21' 1")	6 650 (21' 10")	6 700 (22' 0")	7 460 (24' 6")	7 780 (25' 6")	8 010 (26' 3")	10 950 (35' 11")
H. Min. front slew radius		mm, (ft-in)	3 670 (12' 0")	3 640 (11' 11")	3 660 (12' 0")	2 740 (8' 12")	2 470 (8' 1")	2 730 (8' 11")	5 200 (17' 1")
Digging forces with direct fit bucket									
Bucket radius		mm, (in)	1 470 (58")	1 470 (58")	1 470 (58")	1 470 (58")	1 470 (58")	1 470 (58")	1 250 (49")
Breakout force - bucket									
Normal	SAE J1179	kN, (lb)	130 (29,240)	130 (29,240)	130 (29,240)	130 (29,240)	130 (29,240)	130 (29,240)	68 (15,280)
Power boost	SAE J1179	kN, (lb)	137 (30,890)	137 (30,890)	137 (30,890)	137 (30,890)	137 (30,890)	137 (30,890)	-
Normal	ISO 6015	kN, (lb)	145 (32,480)	145 (32,480)	145 (32,480)	145 (32,480)	145 (32,480)	145 (32,480)	77 (17,270)
Power boost	ISO 6015	kN, (lb)	153 (34,330)	153 (34,330)	153 (34,330)	153 (34,330)	153 (34,330)	153 (34,330)	-
Tearout force - dipper arm									
Normal	SAE J1179	kN, (lb)	119 (26,640)	102 (23,000)	93 (20,880)	119 (26,640)	102 (23,000)	93 (20,880)	44 (9,920)
Power boost	SAE J1179	kN, (lb)	125 (28,160)	108 (24,320)	98 (22,070)	125 (28,160)	108 (24,320)	98 (22,070)	-
Normal	ISO 6015	kN, (lb)	122 (27,340)	105 (23,550)	95 (21,300)	122 (27,340)	105 (23,550)	95 (21,300)	45 (10,050)
Power boost	ISO 6015	kN, (lb)	129 (28,890)	111 (24,890)	100 (22,510)	129 (28,890)	111 (24,890)	100 (22,510)	-
Rotation angle, bucket		°	175	175	175	175	175	175	178

EQUIPMENT.

STANDARD EQUIPMENT

	EC140D	EC160D	EC220D
Engine			
Turbocharged, 4 stroke diesel engine with water cooling, direct injection and charged air cooler that meets Tier 4i requirements	•	•	•
Air filter with indicator	•	•	•
Air intake heater	•	•	•
Cyclone pre-cleaner	•	•	•
Electric engine shut-off	•	•	•
Fuel filter and water separator	•	•	•
Alternator	•	•	•
Cooling system (50 deg. C)	•	•	•
Electric/Electronic control system			
Contronics	•	•	•
- Advanced mode control system	•	•	•
- Self-diagnostic system	•	•	•
CareTrack Satellite	•	•	•
CareTrack 3 yr. subscription	•	•	•
Machine status indication	•	•	•
Engine speed sensing power control	•	•	•
Automatic idling system	•	•	•
One-touch power boost	•	•	•
Safety stop/start function	•	•	•
Adjustable LCD color monitor	•	•	•
Master electrical disconnect switch	•	•	•
Engine restart prevention circuit	•	•	•
High-capacity halogen lights:	•	•	•
- Frame-mounted 2	•	•	•
- Boom-mounted 2	•	•	•
Batteries, 2 x 12 V / 100 Ah	•		
Batteries, 2 x 12 V / 110 Ah		•	
Batteries, 2 x 12 V / 200 Ah			•
Start motor, 24 V / 5.5 kW	•	•	•
Travel alarm	•	•	•
Hydraulic system			
Automatic sensing hydraulic system	•	•	•
- Summation system	•	•	•
- Boom priority	•	•	
- Arm priority	•	•	•
- Swing priority	•	•	•
"ECO" mode fuel saving technology	•	•	•
Boom, arm and bucket regeneration valves	•	•	•
Swing anti-rebound valves	•	•	•
Boom and arm holding valves	•	•	•
Multi-stage filtering system	•	•	•
Cylinder cushioning	•	•	•
Cylinder contamination seals	•	•	•
Auxiliary hydraulic valve	•	•	•
Automatic two-speed travel motors	•	•	•
Hydraulic oil, long life oil 46	•	•	•
Pilot control pattern change	•	•	•
Boom float function without HRV	•	•	•
Overload warning device	•	•	
Boom cylinders (x2)			•
Frame			
Access way with handrail	•	•	•
Tool storage area	•	•	•
Punched metal anti-slip plates	•	•	•
Undercover (heavy-duty)	•	•	•
Full height counterweight:			
- 2 450 kg **(5,400 lb)**	•		
- 3 200 kg **(7,060 lb)**		•	
- 4 200 kg **(9,260 lb)** - Long Crawler (L)			•
- 5 000 kg **(11,030 lb)** - Long Reach (LR)			•
Cab and interior			
ROPS (ISO12117-2) certified cab	•	•	•
Silicon oil and rubber mounts with spring	•	•	•
Travel pedals and hand levers	•	•	•

	EC140D	EC160D	EC220D
Straight Travel pedal	•	•	•
Adjustable operator seat and joystick control console	•	•	•
Fabric seat with heater	•	•	•
Control joysticks with 4 switches each	•	•	•
Heater & air-conditioner, automatic	•	•	•
Flexible antenna	•	•	•
AM/FM stereo with CD player and MP3 input	•	•	•
Hydraulic safety lock lever	•	•	•
Cab, all-weather sound suppressed, includes:	•	•	•
- Cup holders	•	•	•
- Door locks	•	•	•
- Tinted glass	•	•	•
- Floor mat	•	•	•
- Horn	•	•	•
- Large storage area	•	•	•
- Pull-up type front window	•	•	•
- Removable lower windshield	•	•	•
- Seat belt	•	•	•
- Safety glass	•	•	•
- Sun screens, front, roof, rear	•	•	•
- Windshield wiper with intermittent feature	•	•	•
Opening roof hatch	•	•	•
Rear view camera	•	•	
Master key	•	•	•
Undercarriage			
Undercover (heavy-duty)	•		•
Hydraulic track adjusters	•	•	•
Greased and sealed track link	•	•	•
Track Guard	•	•	•
Track shoes			
600 mm **(24")** with triple grousers	•	•	
800 mm **(32")** with triple grousers			•
Digging equipment			
Boom: 4,6 m **(15' 1")** monoblock	•		
Boom: 5,2 m **(17' 1")** monoblock		•	
Boom: 5,7 m **(18' 8")** monoblock			•
Boom: 8,85 m **(29' 0")** monoblock, Long Reach			•
Arm: 2,5 m **(8' 2")**	•		
Arm: 2,6 m **(8' 6")**		•	
Arm: 2,9 m **(9' 6")**			•
Arm: 6,25 m **(20' 6")**, Long Reach			•
Linkage without lifting eye	•	•	
Manual centralized lubrication	•	•	•
Linkage without lifting eye			•

OPTIONAL EQUIPMENT

	EC140D	EC160D	EC220D
Engine			
Block heater: 120 V	•	•	•
Oil bath pre-cleaner			•
Diesel coolant heater, 5 kW	•	•	•
Water separator with heater	•	•	•
Auto engine shutdown	•	•	•
Standard cooling system by fan clutch (40 deg. C)	•	•	•
Fuel filler pump: 35 l/min **(9 gpm)**	•	•	
Fuel filler pump: 50 l/min **(13.2 gpm)**, with automatic shut-off			•
Electric			
Extra lights:	•	•	•
- Cab-mounted 3	•	•	•
- Counterweight-mounted 1	•	•	•
Anti-theft system	•	•	•
Rotating warning beacon	•	•	•
Hydraulic system			
Hose rupture valve: boom	•	•	•
Hose rupture valve: arm	•	•	•
Overload warning device			•

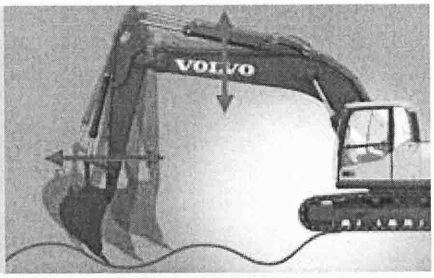
OPTIONAL EQUIPMENT

	EC140D	EC160D	EC220D
Boom float function with HRV	•	•	•
Hydraulic piping:	•	•	•
- Work tool management system (up to 18 programmable memories)	•	•	•
- Hammer & shear, 1 and 2 pump flow	•	•	•
- Hammer & shear: variable flow and pressure pre-setting	•	•	•
- Additional return filter	•	•	•
- Slope & rotator	•	•	•
- Grapple	•	•	•
- Oil leak (drain) line	•	•	•
- Quick coupler piping	•	•	•
Volvo hydraulic quick coupler S1		•	•
Volvo hydraulic quick coupler S6	•	•	
Volvo hydraulic quick coupler U14	•		
Volvo hydraulic quick coupler U16		•	
Volvo hydraulic quick coupler U21			•
Hydraulic oil, biodegradable 46	•	•	•
Hydraulic oil, long life oil 32	•	•	•
Hydraulic oil, long life oil 68	•	•	•
Frame			
Full height counterweight:			
- 2 100 kg **(4,630 lb)**	•		
Cab and interior			
Fabric seat without heater	•	•	•
Fabric seat with heater and air suspension	•	•	•
Control joysticks with semi-long			•
Control joysticks with 3 switch & 1 propotional			•
Rain shield	•	•	•
Falling object guard (FOG)	•	•	•
- Frame-mounted			•
- Cab-mounted	•	•	•
Cab-mounted falling object protective structure (FOPS)	•	•	•
Smoker kit (ashtray and lighter)	•	•	•
Safety net for front window	•	•	•
Lower wiper with intermittent control	•	•	•
Anti-vandalism kit	•	•	•
Undercarriage			
Full track guard	•		•
Undercover (heavy-duty)		•	
Dozer blade	•		
Track shoes			
500/600/600HD/700HD/750 mm **(20"/24"/24"/28"/30")** with triple grousers	•		
500 mm **(20")** with rubber grouser	•		
500/600/700/800/900 mm **(20"/24"/28"/32"/36")** with triple grousers		•	
500/600/600HD/700/900 mm **(20"/24"/24"/28"/36")** with triple grousers			•
Track shoes 700 mm **(28")** with double grousers			•
Digging equipment			
Boom: 4,6 m **(15' 11")** 2 piece boom	•		
Boom: 5,7 m **(18' 8")** monoblock, heavy-duty			•
Boom: 5,57 m **(18' 3")** 2 piece boom			•
Arm: 2,1 m **(6' 11")**, 3,0 m **(9' 10")**	•		
Arm: 2,3 m **(7' 7")**, 3,0 m **(9' 10")**		•	
Arm: 2,9 m **(9' 6")**, 2,5 m **(8' 2")**, 3,5 m **(11' 6")**			•
Linkage with lifting eye	•	•	•
Service			
Tool kit, daily maintenance	•	•	•
Tool kit, full scale	•	•	•

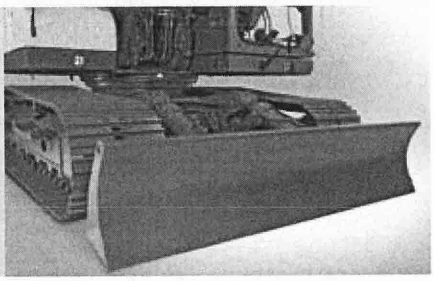
SELECTION OF VOLVO OPTIONAL EQUIPMENT

Auto engine shutdown

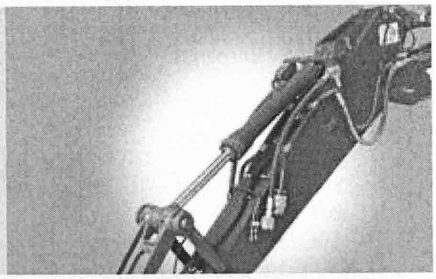
Boom float



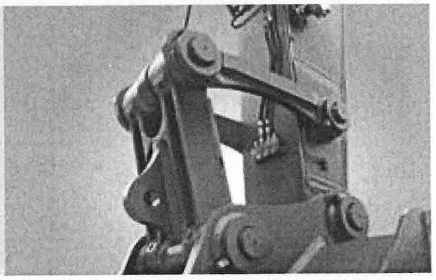
Dozer blade



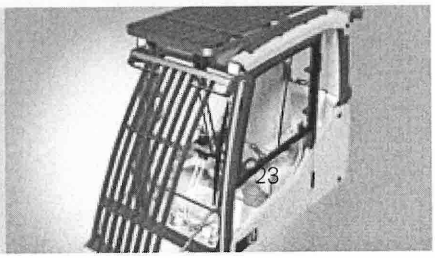
X3



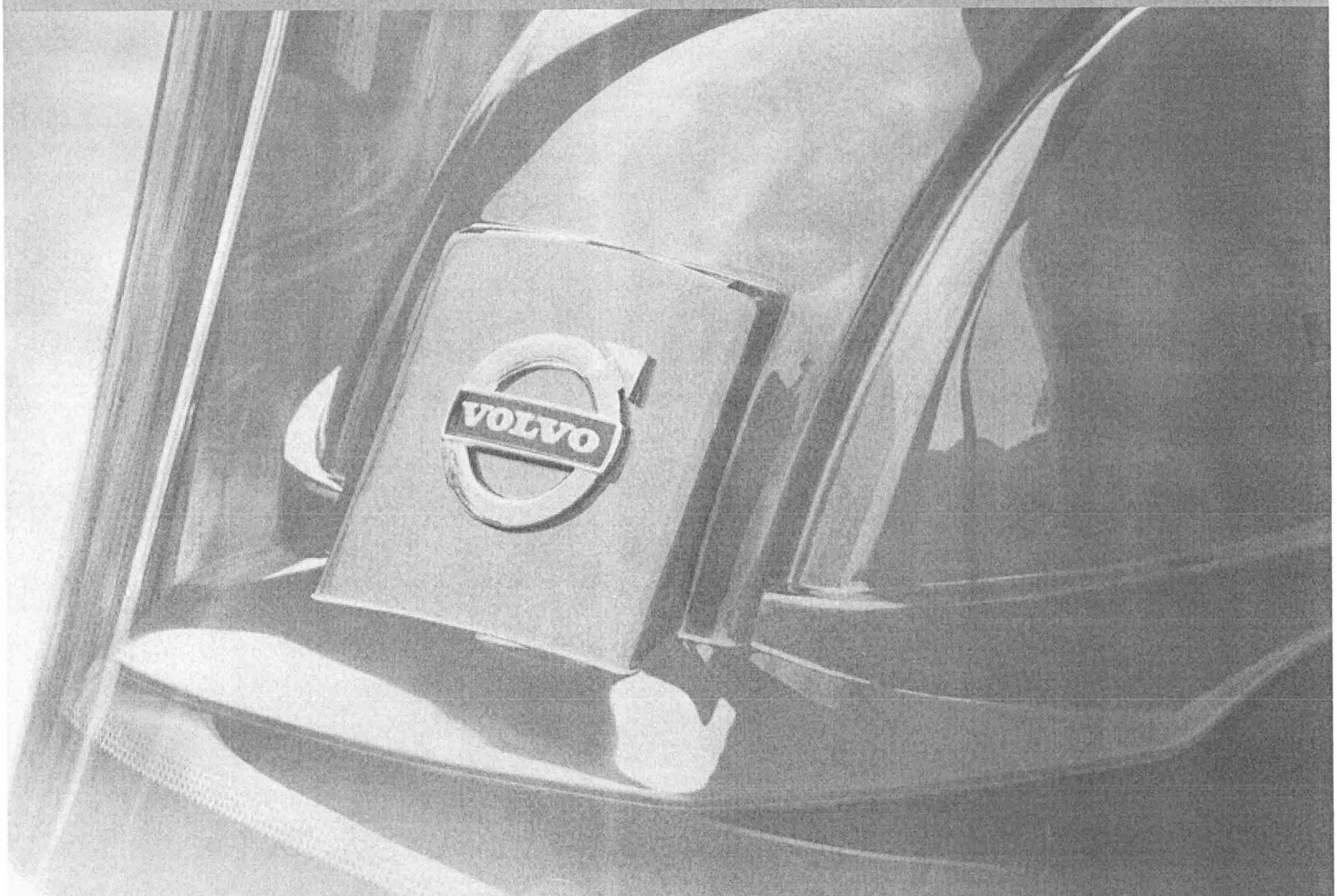
Lifting eye



FOG



VOLVO CONSTRUCTION EQUIPMENT



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